A

SYLLABUS

OF

LECTURES IN MINERALOGY

BY

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CAMBRIDGE

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TO THE

UNIVERSITY OF CAMBRIDGE.

THE following Syllabus contains the subject of those Lectures which met with such distinguished patronage among you. The arrangement is not merely numerical. In order to render it more generally serviceable, attention has been paid to the methodical distribution of Minerals recommended by me; admitting, at the same time, whatever improvement has since been made. In composing it, I had no model, whose perfections I might imitate, or whose errors I might adopt.

In the advancement of Literature, Mineralogy, which at present so much engrosses the study of other Universities, has been ultimately established here. It is peculiarly calculated for the practical illustration of those abstract inquiries, which occupy so considerable a share of our plan of Education. But destitute of every other consideration than the value of truth in all the walks of human wisdom, Mineralogy is entitled to our

regard. The Elements of Vegetable and Animal Existence, are the objects of its consideration*. Viewing the organization of Plants and Animals, we refer to the principle of Animation, as a visible and mediary agent, by which our thoughts ascend to the Giver of Life. But when we behold inert matter, assuming forms the most beautiful and regular; obeying the strictest geometric laws; and indicating the presence of intelligence the most awful; we at once look up to Him, who has thus spoken in his Holiness, and whose "hands prepared the dry land."

If hereafter it shall appear that the theme of our investigation is of considerable National Importance; that it not only opens a new avenue to Science, but materially affects the best interests of the Empire; this memorial of the encouragement it received, will not be regarded by you with indifference.

E. D. CLARKE.

CAMBRIDGE,
August 12, 1807.

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* Natura creata modificat Terras in Vegetabilia, Vegetabilia in Animalia.
LINNAEUS.

LOGIC OF THE DISTRIBUTION.

CLASS.....*The predominating elementary Principle.*

ORDER.....*Its characteristic Property.*

GENUS.....*The individual Substance.*

SPECIES.....*Its Combination.*

VARIETY.....*The Phœnomenon.*

15. Simplest Method of arranging Minerals.
16. Logic of the Distribution.
17. Mineralogical Writers.
18. Crystallography.
19. Comparison between the Theories of De L'Isle and Hauy.
20. Mechanical Division of Crystals.
21. Primitive Form—how obtained—Circumstance which led to the Discovery.
22. Distinction between Primitive and Secondary Forms.
23. Subdivision of the Nucleus, or Primitive Form.
24. Integral Particle—Meaning of the Term—when similar, and when different, from the Nucleus.
25. Laws by which Secondary Forms result from the Accumulation of the Primitive.
26. Practical Illustration by Models.
27. Consequences of the Theory.
28. Specific Gravity of Bodies—Process by which it is determined.

CLASS I.

29. EARTHS.

30. Of Earthy Substances in general—their Combination with each other—with Metallic Oxides —and with Acids.

ORDER I.

31. *Earths with Acias.*

GENUS I.

32. **LIME.**

33. Why placed first in the List of Mineral Substances —Opinions respecting its Origin—Discovery of SAUSSURE—Conjecture of LAVOISIER.

SPECIES I.

34. LIME *with Carbonic Acid.*

VARIETY:

35. Rock Milk—its various Appellations—how formed.

36. Chalk—how distinguished from Rock Milk—its Origin—Position of the Strata—Extraneous Fossils not essential Characteristics of Chalk Strata.

37. Caution respecting the Notion of Petrifaction—Real History of such Phænomena.
38. Circumstances of Alliance between Lime and Silex.
39. Erroneous Notion that Metallic Ores are not found in Chalk.
40. Common Limestone.
41. Singular Appearance of incipient Limestone from the Coast of the Black Sea.
42. Consequences which resulted from the Natural Opening of the Thracian Bosphorus—Strata of Marine Shells on the Cliffs of the Black Sea—Story of the Argonauts—original Junction of the Aral, the Caspian, and the Euxine.
43. Singular extraneous Fossil in Limestone at the Pyramids of Egypt—observed by Professor PALLAS in the Crimea—described by STRABO, in his Account of the Pyramids—Confirmation of that Writer's Accuracy.
44. Examples of Animal Matter changing to Crystals of Carbonated Lime—magnificent Specimen found near Cheltenham.
45. Native Bitumen accompanying the Remains of organized Bodies in Limestone.
46. Distinction between Primitive and Secondary Limestone.

47. Calcination of Limestone.
48. Heights of Jura—of Arragon—Mont Perdu—Hymettus—Parnassus.
49. Remarkable Position of Limestone Hills—Plains of Attica—Bœotia—Thessaly—Vale of Tempe.
50. Confused Crystallization of Carbonated Lime.
51. Of Marble—Primitive and Secondary—how distinguished from each other—Durability of Marble.
52. Of the Marble in use among the Antients—Temples in the Acropolis of Athens—of the Parian, Thasian, and Naxian Marble—Antient Quarries in the Isle of Paros—Temple of Bacchus at Naxos—Colossal Statue near the Naxian Quarries—Medicean Venus—Belvidere Apollo—Antinous, &c.—Causes of the Prevalence of Parian Marble in Antient Statues.
53. Pentelican Marble—why inferior to the Parian—Fragment of the Eleusinian Statue.
54. Carrara Marble—Cipolino Marble—why so called—its defects.
55. Of extraneous Substances found in Marble.
56. Red and Yellow Antique Marble—Pompeia—Villa of Adrian at Tivoli.
57. Lacedæmonian Green Marble—Temple of Erectheus—Churches of Rome—Seraglio at Constantinople—Cause of Colour in Marble.

58. Lumachella --- of Carinthia --- of Astracan --- Occhio di Pavone---Castracani.
59. Madreporite---extraordinary Instance of Basaltic Limestone---Opinion warranted by such Phænomena.
60. Marble of Brunswick and Franconia --- Elastic Marble---Dolomite.
61. Of Polzevera, or Green Marble of Genoa.
62. Mediterranean Isles---China---Ural Mountains in Siberia.
63. Marble of Tiri in the Hebrides.
64. Fetid Limestone --- confounded with Black Marble---Cause of its offensive Effluvia---Antient Gothic Sculpture in France.
65. Of Stalactite---Alabaster---Abuse of the Term---Alabaster of the Antients---Prevalence of the Stalactite Form in the Mineral Kingdom.
66. Crystallization of Alabaster---similar Appearances in Metallic Stalactites---Origin of Stalactites---and of Stalagmites--- Flos Ferri--- Pisolite---- Petrified Moss.
67. Of Bird's Nests petrified with their Eggs--- Manner of effecting such Appearances.
68. Of Satin Spar---its Natural History.
69. Spar.
70. Of Crystallization in general---Crystallization

the best Criterion of Distinction---two Modes by which it is effected---the Basaltic Form a Consequence of Crystallization---equally effected by Water, or by Fire---Recapitulation of the Laws respecting Crystals.

71. Of the Parallelopiped---the Triangular Prism---and the Tetrahedron.

72. Of the Parallelopiped---the regular Tetrahedron ---the Octahedron---the Six-sided Prism---the Dodecahedron terminated by Rhombs---and the Dodecahedron with Isosceles Triangular Faces.

73. Cause of Secondary Forms in Crystals.

74. Iceland Spar.

75. Extraordinary Appearance on the Summit of Parnassus.

76. Double Refraction of Rhomboidal Spar.

77. Difficulty in accounting for that Appearance---explained by HAUY.

78. The Forms of Crystallized Carbonated Lime.

79. Cannon Spar.

80. Arragonite.

81. Hexahedral Prism, terminated by Pyramids.

82. Nail's-Head Spar.

83. Dog-Tooth Spar—Manner of its Formation on the Nucleus, or Primitive Form.

84. Carbonated Lime in Hexahedral Prisms, terminated by Hexahedral Pyramids—How distinguished from Rock Crystal, or Quartz Crystallized.
85. Erroneous Notion respecting the Phosphorescent Properties of Bodies.
86. Substance called Phosphoric Marble of Vesuvius.
87. Pearl Spar—Its Transition to Sparry Iron.
88. Radiated Spar—confounded with Zeolite.
89. Ludus Helmontii.

C. 1. *O.* 1. *G.* 1.

SPECIES II.

90. LIME *with Sulphuric Acid.*

91. Circumstances which characterize this Combination.
92. Common Plaister-Stone considered by HAUY a Mineral Aggregate.

VARIETY:

93. Snowy Gypsum—Manner by which this Appearance is produced.
94. Earthy Gypsum—or Porous Sulphated Lime.
95. Common Compact Sulphated Lime.
96. Gypsous Alabaster—Manner of its Formation.

97. Enquiry concerning the appropriate Signification of the Term Alabaster—Antient History of the Substance so called.

98. Alabaster of PLINY—of HAUY, PATRIN, MACQUER, CHAPTAL, and BRISSON—Uses to which the Antients applied Alabaster—Comment of WALLERIUS on the Text of PLINY.

99. Alabaster not necessarily Carbonated Lime.

100. Alabaster of the Moderns—Antient Tombs in English Churches.

101. Satin Gypsum.

102. Fibrous Gypsum—Silky Gypsum.

103. Anhydrous Gypsum—where found—how distinguished from all the Varieties of Sulphated Lime—Cause of its Appellation.

104. Selenite—what comprehended by the Term—why preferred to a more scientific Appellation—its Essential and Physical Characters—Primitive Form—Integral Particle.

105. The Gonyometer—its Use and Description.

106. Selenite, how distinguished from Carbonated Lime—and from Muscovy Talc—where found most abundantly.

107. Lenticular Selenite—Trapezian Selenite.

C. 1. *O.* 1. *G.* 1.

SPECIES III.

108. LIME *with Fluoric Acid.*

VARIETY:

109. Phosphorescent Earth of Marmarosch, in Hungary.

110. Fluor—its Colours—and Uses—how and where found—its Chemical Analysis—and Phosphorescence—decomposed by the Action of Volcanic Fires—Crater of Vesuvius—Accident which caused the Observation.

111. Peculiar Characteristics of Fluoric Acid—its Action upon Glass—and other singular Properties when in a Gaseous Form.

112. Extraordinary Discovery of a French Chemist—its Consequences in the Arts—Invention of Puymaurin.

113. Vitreous Alabaster of Romé de L'Isle—PLINY's Account of the Myrrhine Vases.

114. Extraordinary Appearance of Siberian Fluor—singular Illumination described by PATRIN.

115. Fluor Spar.

116. Transition from the Primitive to a Secondary Form.

117. Green Cubic Fluor Spar.

118. False Emeralds.

119. More complicate Forms of Fluor Spar.

C. 1. *O.* 1. *G.* 1.

SPECIES IV.

120. LIME *with Phosphoric Acid.*

121. By whom discovered in the Mineral Kingdom—Name given to this Combination.

VARIETY:

122. Massive Phosphated Lime.

123. Radiated Phosphated Lime.

124. Apatit—its Forms—Colours—and Chemical Analysis—Size and Rarity of the Crystals—how allied to Fluor Spar—supposed Origin of Apatit, and Fluor Spar.

125. Spanish Chrysolite.

C. 1. *O.* 1. *G.* 1.

SPECIES V.

126. LIME *with Arsenic Acid.*

VARIETY:

127. Pharmacolite—why so called—where found—how distinguished from Carbonated Lime—its Appearance.

128. Termination of the First Genus—Combinations omitted in the List of Species—Cause of the Omission.

C. 1. *O.* 1.

GENUS II.

129. **ALUMINE.**

130. Cause of its Appellation—Opinion respecting its Origin—its Proportion in Clay—in Primitive Rocks—Objection to the Theory of FAUJAS DE ST. FOND—Digression—Alumine not found pure—its Combination in Alum—Caution respecting Substances called Native Earths—Importance of Alumine in Vegetation—its Uses in the Arts—its Influence in Gems—Cause of its supposed *Earthy Smell.*

C. 1. *O.* 1. *G.* 2.

SPECIES I.

131. ALUMINE *with Sulphuric Acid and Potass.*

VARIETY:

132. Of Alum—its Place in the System doubtful—Alum of Commerce—Ore of Alum—Norwegian Slate—Cause of its Black Colour.

Alum Works of Christiania, in Norway—Process of extracting Alum from its Ores—its Form in crystallizing — whence originally imported — Establishment of Alum Works in England.

Native Alum—its Rarity—when, and by whom found—TOURNEFORT—OLIVIER—Alum Crystals of Rome.

C. 1. *O.* 1. *G.* 2.

SPECIES II.

ALUMINE *with Fluoric Acid.*

Excessive Rarity of this Combination—where, and by whom discovered.

VARIETY:

Cryolite—analyzed by ABILDGAARD—more recently by KLAPROTH—its extreme Fusibility.

C. 1. *O.* 1. *G.* 2.

SPECIES III.

ALUMINE *with Mellitic Acid, and a small Portion of Bitumen and Lime.*

Discovery of the Combination—Honey-Stone—WERNER.

VARIETY:

140. Mellite—where found—Form of its Crystals—its recent Analysis—why not placed with Combustibles—other Forms of Mellite—Curvilineals unknown in Crystallization—its specific Gravity—and Vegetable Origin.

C. 1. *O.* 1.

GENUS III.

141. ## MAGNESIA.

142. Manner in which it first became known—confounded with other Substances—not found pure—whence obtained.

C. 1. *O.* 1. *G.* 3.

SPECIES I.

143. MAGNESIA *with Sulphuric Acid.*

VARIETY:

144. Epsom Salt—Springs of Sedliz—Egra in Bohemia—the Alps—Switzerland—Montmartre—Montpellier—Andalusia.

C. 1. *O.* 1. *G.* 3.

SPECIES II.

145. MAGNESIA *with Boracic Acid.*

146. Unique Appearance of this Combination—Boracite—Analysis of VAUQUELIN—and of SCHMIDT—where found—Form of its Crystals—Cubic Quartz of Lunebourg—Electrical Property of Boracite—its Analysis by WESTRUMB.

C. 1. *O.* 1.

GENUS IV.

147. **BARYTES.**

148. Original Name of this Earth—by whom discovered—whence obtained—its Combinations.

C. 1. *O.* 1. *G.* 4.

SPECIES I.

149. BARYTES *with Sulphuric Acid.*

150. Confounded with Sulphated Lime—WITHERING's Analysis—Doubts concerning the real

Nature of Substances containing this Combination—Suspicion of LAVOISIER—Death-bed Declaration of PELLETIER.

151. Sulphated Barytes of Hungary—of Bletchingly in Surrey—of Deux Ponts—of Offenbanya, in Transylvania—its Use in China.

152. Earthy Sulphated Barytes—its improper Appellation.

153. Ponderous Alabaster—the Bologna Stone—Cawk.

154. Ponderous Spar—Metallic Marble—Primitive Form, where found—how distinguished from that of Carbonated Lime—numerous Secondary Forms—Aggregation of Secondary Forms—Natural Illustration of HAUY's Theory.

C. 1. *O.* 1. *G.* 4.

SPECIES II.

155. BARYTES *with Carbonic Acid.*

156. Of Witherite—its Resemblance to other Bodies—how distinguished—its Chemical Ingredients—Specimen observed by PATRIN in Siberia—its Poisonous Quality—Rarity of its Crystals—their Form.

C. 1. *O.* 1.

GENUS V.

157. **STRONTIAN.**

158. Manner in which this Earth was first noticed—Analysis of HOPE—and of KLAPROTH.

C. 1. *O.* 1. *G.* 5.

SPECIES I.

159. STRONTIAN *with Carbonic Acid.*

160. Strontianite — how distinguished from Carbonated Barytes — its Colour — and most usual Appearance.

C. 1. *O.* 1. *G.* 5.

SPECIES II.

161. STRONTIAN *with Sulphuric Acid.*

162. Celestine — many Characteristics in common with Carbonated Lime — double Refraction — friable Sulphat of Strontian — laminary — fibrous — Celestine of Pennsylvania — Plumose

Sulphated Strontian—Earthy Sulphat of Montmartre—Places where Celestine is found—its Primitive Form—Hardness—immense Size of the Sicilian Crystals—how distinguished from Carbonated Strontian.

C. 1.

ORDER II.

163. *Earths without Acids.*

164. Reason assigned for the Characteristic Property of this Order.

C. 1. *O.* 2.

GENUS I.

165. **SILEX.**

166. Its Place in the System—Seat of Siliceous Stones—Flint—Sand—Gravel—Granite—Quartz—Use of Silex in the Arts—Solubility—Proportion in Primitive Rocks.

C. 1. *O.* 2. *G.* 1.

SPECIES I.

167. SILEX *almost pure.*

168. Proportion of Silex in the Varieties of this Species.

VARIETY:

169. Quartz—its vast Proportion as a Constituent of the Globe — its Appearance in Granite — in Porphyry—in Schistus—in Primitive Marble—its Position in Nature—Metallic Ores—Desarts of Africa—moveable Hills—Space it occupies in Cabinets of Mineralogy.

170. Extensive Signification of the Word Quartz in the Abbé HAUY's Distribution.

171. Colours and Transparency of Quartz—D'ENGESTRÖM—Diaphanous Quartz of Rörååås, in Norway.

172. Common Amorphous Quartz.

173. Milky and Rosy Quartz—Aventurine—Origin of the Appellation.

174. Crystallized Quartz—Primitive Form—Rock Crystal—Mountain Crystal—Crystal Hunters — Crystal Grottoes — Circumstances which

indicate the Abode of Crystals — Granite Mountains — St. Gothard.

175. Madagascar Crystals — astonishing Specimen from the District of *Valois*—Groupe at *Capo di Monte,* in Naples—Superb Crystal in the Imperial Cabinet at Vienna—Deviations from the usual Form of Rock Crystal—Inference drawn from such Appearances.

176. Crystals of Oisan in Dauphigny—Isle of Elba—Circumstances resulting from the Position of Crystals—Marble Pebbles of Remusat in Dauphigny—Diamonds of Alençon.

177. Extraneous Substances in Rock Crystal—in the Compostella Crystals—in Crystals of the Alps and Pyranees—Byssolite—in Madagascar Crystals — *Cheveux de Venus* — *Cheveux de Thetis* — *Cheveux de Mars.*

178. Other Peculiarities respecting Rock Crystal — Crystals of Hungary and Saxony.

179. Of the Colouring Principle in Rock Crystals—False Names applied to Crystals of different Hues—Bohemian Topazes—Occidental Sapphires —Amethysts.

180. Of Siliceous Stalactites—their various Appearances—Pure Silex found in Stalactite.

181. Modifications of Mineral Forms.

182. Opal—Manner of its Existence—where found —Abbé NEUMANN's Collection at Vienna— Opal Mines of Hungary—Circumstances which characterize the Discovery of Opal—Cause of its Opacity—Hydrophanous Opal—Oculus Mundi —other Substances having the same Property— Colours of Opal—Cacholong—Wood Opal— Cause of that Appearance—prodigious Specimen from Bulgaria.

183. Of Flint—Manner of its Formation—PATRIN's Theory of its Origin—how found—Manufacture of Gun Flints—Decomposition and Transition of Flint—Of the swimming Flint—Collision of Flints—Colour—Use of Flint among the Antient Nations—Fairy Speds—Plain of Marathon— extraordinary Appearance of a Flint found near Ware.

C. 1. *O.* 2. *G.* 1.

SPECIES II.

184. SILEX *with Alumine.*

185. Pleasing Phænomena of this Combination.

VARIETY:

186. Chalcedony—its Relationship to Flint—Origin of its Name—Manner of its Formation—

superfluous Distinctions made from its Appearances — Carnelian — Sard — Sardonyx — Onyx — Mocha Stone — Agate.

187. Prase — Chrysoprase — extreme Rarity of Black Chalcedony — Locality of different-coloured Chalcedonies — superb Stalactite from the Cornish Mines — Chalcedony of Iceland — Montrose Pebbles — Blue Siberian Chalcedony — Cause of Blue Colour in Chalcedony — Chalcedonies of Auvergne — Pseudomorphose Forms of Chalcedony — Geyser Springs of Iceland — Chalcedony of Hungary and Saxony — Specimen in the WOODWARDIAN Collection.

188. Uses to which the Antients applied Chalcedony of the Intaglios and Caméos of Greece and Rome — remote Antiquity of Signet Rings — Works of PYRGOTELES.

189. Distinction between Sardonyx and Onyx — Red Chalcedonies of Chaldæa — Arabia Felix — Persian Gulph — Red Sea — Mocha Stone — Mistake concerning the Origin of its Name — Cause of its Dendritic Appearance — Turkish Gems — Opinions respecting the Crystallization of Chalcedony — Rhomboïdal Form of Chalcedony found in Cornwall.

190. Enhydrous Chalcedony — Origin of the Substance

confounded with Cacholong — Application of the word *Sard*—Treasury of MITHRIDATES — Appearances of Red Chalcedony—its Use among the Turks.

191. Cause of the Name and Colour of Prase—its proper Place in the System—Green Agate—Prase like Chalcedonies of Kamtchatka, and the Hebrides — Substances confounded with Prase—imaginary Crystals of that Mineral.

192. Of Plasma—Mother of Emerald—Antique Ring-Stones — different Substances shewn for this Variety.

193. Various Appearances of Blue Chalcedony.

194. Of Hornstone — how it differs from Flint — Petro-silex—Hornstone Stalactite—Appearance called Crystallized Hornstone—Lenticular Quartz of PASSY.

195. Jasper—Analysis by ROSE—Infusibility — how allied to other Siliceous Concretions—Stalactite Jasper—Ribbon Jasper—Yellow Jasper—Red Jasper—Siberian Jasper of PATRIN—Egyptian Flint—Desart of Suez.

196. Opinion of BUFFON respecting Jasper — of SAUSSURE and DOLOMIEU—Cause of Hardness in Jasper—Rose-coloured Magnesian Jasper of

Siberia—PATRIN on the Formation of Jasper—Green Stone of the Isle of Rum—Antique Jasper Vase of the Byzantine Emperors—Porcelain Jasper.

197. Agate—a Mineral Aggregate—Origin of its Name—its supposed Virtues among the Antients—Constituents of Agate—Onyx of PALLAS—Oriental Agate—Explanation of the Process by which Agate is deposited—Fortification and Landscape Agate—Moss Agate—Punctuated Agate—Petrifaction Agate—Uses of Agate—Manufactures of Oberstein.

C. 1. *O.* 2. *G.* 1.

SPECIES III.

198. SILEX *with Alumine, and Oxide of Iron.*

199. Distinction visible in the external Character of Varieties resulting from this Combination—Crystallization.

VARIETY:

200. Mica—Gold Sand—regular Forms of Mica—Muscovy Glass—Mica of the Lake Baical, in

Siberia—superb Groupe of Rhomboïdal Mica, with other Substances, crystallized in Hebraic Stone—Primitive Form of Mica.

201. Talc—its Relationship to Mica—how distinguished from that Substance—Electrical Property of Talc—Colours of Talc—*Toilette Rouge*—Unctuosity, and Infusibility of Talc.

202. Hornblende—different Names of Hornblende—vicious Use of the word *Schorl*—Primitive Form of Hornblende—its Situation in Nature—Substances confounded with it—Hornblende of KIRWAN and HAUY—how distinguished from Tourmaline — Analysis of Hornblende — the Presence of Magnesia not necessarily a Cause of the unctuous feel in some Minerals — Schistose Hornblende of Sweden.

203. Obsidian—Controversy excited by its Appearance —its real Origin—Discovery made by Professor ESTMARK — its Relationship to Pumice — Volcanoes of Lipari—Obsidian Mirrors in Peruvian Tombs—in use among the Romans — where found—its Colours.

C. 1. *O.* 2. *G.* 1.

SPECIES IV.

204. SILEX *with Alumine and Potass, or Soda.*

VARIETY:

205. Pumice—its Appearance in Hungary according to ESTMARK; and in other Places—Isle of Ischia —confounded with the Scoriæ of Volcanoes— Pumice of Pompeia—Promontory of Misenum —Floating Pumice of the Indian Seas—of the Rhine—of the Isle of Santorini.

206. Pearl Stone—of Tokay, in Hungary—found by PALLAS in Kamtchatka as a Matrix of Obsidian —Volcanic Zeolite of FICHTEL—ESTMARK—Circumstances which characterize its Origin — its Analysis by KLAPROTH — its Geognostic and Geographic Situation — Dr. TOWNSON's Observations on this Mineral.

207. Pitchstone—Discovery of KLAPROTH during its Analysis — the name often applied to other Minerals—Volcanic Glass—Description of the Substance called Pitchstone by KLAPROTH — Pitchstone of the Isle of Arran—its Relationship

to Pearl Stone — Circumstances attending its immersion in Water—not a Volcanic Product —its Resemblance to Obsidian—Specific Gravity, and latest Chemical Analysis.

208. White Garnet—Leucite—Amphigéne—Presence of Potass in the Mineral Kingdom detected during its Analysis — Form and Size of its Crystals—Transparency — Lava enveloped by them—Via Appia—Specimen containing Native Gold—its Specific Gravity—Fracture.

209. Lepidolite—Cause of its Name—Analysis by VAUQUELIN—where, and by whom, discovered —its Resemblance to Avanturine.

210. Feldspar — its double Refraction — Phosphorescence—common Appearance—Primitive Form —Mountains of Norway, Sweden, and Finland —Colours of Feldspar.

211. Amazonian Stone—Rhomboïdal Siberian Feldspar — Colours of the Labrador Feldspar— superb Crystal found by PALLAS at Mursinka, in Siberia—Explanation of its Form—Deception caused by its apparent Colour—Intersection of Crystals—Adularia.

212. Of the Hebraic Stone—its peculiar Geographic Situation—remarkable Position of its Crystals —Difference between the Hebraic Stones of Europe and Asia.

222. Of the Siberian Emerald---Localities of this Mineral---their occasional Resemblance to Basaltine Forms---Volatile Fluid which exhales on breaking them---Forms of Siberian Emerald---Circumstance which indicates the Abode of Emeralds---terminating Pyramids at the Extremity of Emerald Prisms---Three Kinds of Siberian Emeralds.

223. Euclase---Cause of its Name---Loss sustained in the Analysis of this Mineral---its Fracture, and double Refraction.

C. 1. *O.* 2. *G.* 1.

SPECIES VIII.

224. SILEX *with Alumine and Barytes.*

VARIETY:

225. Harmotome---Cross Stone---Form of its Crystals---Agate Balls of Oberstein---Harmotome of Strontian—different Names of this Mineral---how distinguished from Substances which it resembles---Cause of the occasional Effervescence it exhibits in Acids---its Primitive Form, and integral Particle—Reason for preferring HAUY's Name of this Mineral.

C. 1. *O.* 2. *G.* 1.

SPECIES IX.

226. SILEX *with Lime and Alumine.*

VARIETY:

227. Lazulite---extraneous Substances aggregated in the Stone so called---its Uses in the Arts---Ultramarine---Qualities of that Colour---Defects caused by it in Pictures of the old Masters---Process by which Ultramarine is extracted from the Stone---Origin of its Name---usual Size of Specimens of Lazulite---remote Country in which it has been found---its situation in Nature---Marble Palace of Orloff---Phosphorescence of Lazulite---its Specific Gravity, and Property in common with Zeolite.

C. 1. *O.* 2. *G.* 1.

SPECIES X.

228. SILEX *with Alumine and Lime.*

VARIETY:

229. Scapolite---Rapidolite---Form of its Crystals---where found---little known concerning this Mineral---its Resemblance to Zeolite.

230. Dipyre---Cause of its Name---its Resemblance to other Minerals---Phosphorescence--- its Colour, Specific Gravity, and Chemical Analysis.

231. Hyalite---Circumstances which characterize its Natural Deposition --- Analysis by LINK --- its Infusibility.

C. 1. *O.* 2. *G.* 1.

SPECIES XI.

232. SILEX *with Alumine, Water, Lime, and Potass.*

VARIETY:

233. Zeolite---Circumstances which distinguish the Alkaliferous Substances in *this Species,* from the Varieties of *the Fourth*---Effect of Water as a Chemical Agent in the Modification of Mineral Forms---of Water in its Approach to Crystallization---singular Phænomenon observed in Russia.

234. Substances once considered as Zeolite---Distinctions made by the Abbé HAUY---particular Mineral intended by the Name Zeolite---Mesotype of HAUY --- Radiated, Fibrous, and Prismatic Zeolite—Specimen from Iceland exhibiting all those Forms---Acicular Mesotype---Cause of

the Appearance called Mealy Zeolite---Interpretation of the word Mesotype illustrated by Models---Distinction between Zeolite, Stilbite, and Analcime.

235. Manner in which Zeolite is found—its double Refraction—Colours—Red Zeolite of Ådelfors, in Sweden—not admitted by HAUY in a Methodical Distribution — Electrical Property of Zeolite — Origin of its Name — its Phosphorescence—its Property with Acids—Analysis of Zeolite by VAUQUELIN—and by HUTTON.

236. Stilbite---Lamellar Zeolite---its distinguishing Characteristics---Etymology of its Name---in what its Primitive Form differs from Zeolite---Stilbite of Andreasberg, in the Hartz --- how accompanied---Form of its Crystals---its Texture ---Specific Gravity---not confined to a Volcanic Soil.

237. Analcime --- Cubic Zeolite --- Hard Zeolite of DOLOMIEU---where found---Cause of its Name ---Primitive Form and Integral Particle---how distinguished from Stilbite, from Zeolite, and from Amphigéne---Analcime of Dunbarton---Forms of its Crystals.

238. Chabasie---its Appearance in the Agate Balls of Oberstein --- Consequence of its Discovery---

Form of its Crystals—confounded with Analcime —Secondary Forms of Chabasie---how distinguished from Zeolite --- and from Carbonated Lime.

239. General Observations concerning the Eleventh Species.

C. 1. *O.* 2. *G.* 1.

SPECIES XII.

240. SILEX *with Alumine, Lime, and Oxide of Iron.*

VARIETY:

241. Prehnite---in what it differs from Zeolite --- by whom first discovered---subsequent Voyage of PREHN --- different Minerals with which it was confounded---ROME DE L'ISLE---WERNER ---BORN---Analysis by HASSENFRATZ---and by KLAPROTH.

242. Discovery of Prehnite in France---SCHREIBER--- RAMOND --- Prehnite of Dunbarton --- Minerals which accompany Prehnite---Substance in which it is found---its Character in common with Zeolite --- Uncertainty respecting its Primitive Form --- Koupholite---Colours and Texture of Prehnite.

243. Axinite---Cause of its Name---Visible Subdivision of the Nucleus by a Natural Process---Associations of Axinite --- Thummerstone --- Violet Schorl---its common Colour, Fracture, and Specific Gravity---Difference in its Analysis by KLAPROTH and by VAUQUELIN---Axinite of the Pyrenees---of Norway---and of Cornwall.

244. Epidote---Green Schorl---Appearance alluded to by ROME DE L'ISLE under that Appellation ---Delphinite---Glassy Strahlstein---Thallite---Glassy Actynolite --- Arendalite --- Akanticone ---Want of Precision in the Accounts of this Mineral---new Distinction made by WERNER ---Pistazite---Primitive Form of Epidote---how distinguished from Tourmaline --- and from Emerald---confounded with Actinote.

245. Of Scorza.

246. Garnet---not confined to the Crystalline State --- its Dodecahedron particularly described --- Abundance in Nature---Manufactory of Garnet at Loretto --- Garnet of Fahlun --- Enormous Crystal found there --- Use of Garnet among the Antients --- Antique Gems of Cyprus --- Carbuncle—THEOPHRASTUS—PLINY—EZEKIEL.

247. Of the Syrian Garnet --- State of Garnet in Nature---Substances by which it is accompanied

—Mines of Kongsberg in Norway—Association of this Mineral with Iron—Analyses of various Garnets—Colours—Paters.

242. Of the Bohemian Garnet—Pyrope—Black Garnet—Melanite—Sand of Cayenne—remarkable specific Gravity of Garnet—Amorphous Garnet—extensive Application of the Term *Garnet* by Bourson.

C. 1. O. 2. G. 1.

SPECIES XIII.

249. SILEX *with Lime, Alumine, Oxide of Chromium, Magnesia, and Oxide of Iron.*

VARIETY:

250. Smaragdite---State in which it has been hitherto observed --- Diallage --- other Names of this Mineral---discovered in Seringapatam --- where found by Saussure---Green Marble of Corsica ---how distinguished from Green Feldspar--- Smaragdite of Labrador.

C. 1. *O.* 2. *G.* 1.

SPECIES XIV.

251. SILEX *with Magnesia.*

VARIETY:

252. Keff-Kill---MEERSCHAUM---ECUME DE MER---place whence the Keff-Kill of Commerce is now derived---its Appearance when first dug ---Manufacture of Pipe-Bowls.

253. Steatite---not to be confounded with Lard-Stone, Soap Rock, &c. --- how distinguished from those Bodies---of the greasy Feel in some Minerals---of the Appearance called Crystallized Steatite --- remarkable Texture of Steatite --- its probable Origin---Colours---Infusibility.

C. 1. *O.* 2. *G.* 1.

SPECIES XV.

254. SILEX *with Magnesia and Lime.*

255. Resemblance between the Phænomena of this Species and those of the last.

VARIETY:

256. Asbestus—Incombustible Flax—Asbestine Cloth of the Antients—Amianthus—Difference in the

Specific Gravities of Asbestus and Amianthus—its probable Cause.

257. Of radiated Asbestus—where found—state in which it appears when first taken from its Matrix.

258. Of the ever-burning Lamps of the Antients—Incombustible Wicks for Lamps—KIRCHER—modern Art of manufacturing Asbestine Cloth—Silk Mountain of the Ural Alps—Of Paper manufactured of Asbestus—its advantages—Use of Asbestus in the Fabrication of Earthen Ware.

259. Origin of Asbestus—its Profusion in Corsica—Quartz penetrated by Asbestus—Mountain Cork—Rock Leather—Rock Wood—&c.

260. Actinote—other Names of the Appearance so called—careful Distinctions made by HAUY in his Description of Actinote—its Specific Gravity—Colours, &c.

261. Malacolite—Sahlite—confounded with Feldspar—Tiri Marble—late Observations respecting the Constituents of that Mineral Aggregate.

C. 1. *O.* 2. *G.* 1.

SPECIES XVI.

262. SILEX *with Oxide of Iron, Lime, and Magnesia.*

VARIETY:

263. Pyroxene—Augite—not a Product of Fire—

Basaltic Hornblende — Beautiful Illustration of HAUY's Appellation, in Vesuvian Specimens— other Appearances — Form of its Crystals — Darkness of its Colours — Fracture — Specific Gravity.

C. 1. *O.* 2. *G.* 1.

SPECIES XVII.

264. SILEX *with Magnesia, Oxide of Iron, and Lime.*

VARIETY:

265. Idocrase — Vesuvian — its Use in Commerce— Idocrase of Vesuvius—Idocrase of Kamchatka— Form of its Crystals—Primitive Form—confounded with Hyacinth, Chrysolite, and Topaz—double Refraction — Indecision respecting its Chemical Analysis — Distinction between Idocrase and Garnet—Idocrase and Chrysolite.

266. Meionite—White Hyacinth of Somma—diminutive Size and Form of its Crystals — how distinguished from Idocrase, Zircon, Harmotome, and Sommite—its Fracture and Fusibility.

C. 1. *O.* 2. *G.* 1.

SPECIES XVIII.

267. SILEX *with Lime.*

VARIETY:

268. Tremolite --- Cause of its Name --- its Appearances --- Phosphorescence --- often confounded with Asbestus.

269. Of Asbestiform Tremolite---remarkable Appearance by which it is accompanied in Norway---Common Tremolite---Glassy Tremolite.

C. 1. *O.* 2. *G.* 1.

SPECIES XIX.

270. SILEX *with Lime and Oxide of Copper.*

VARIETY:

271. Dioptase---confounded with Emerald---THOMSON --- LAMETHERIE --- How distinguished from Emerald --- supposed Emerald Mine of Chinese Tartary---Specific Gravity of Dioptase.

C. 1. *O.* 2.

GENUS II.

272. **ALUMINE.**

273. Consequences resulting from the new characteristic Property of this Earth---Oriental Gems ---their Estimation in the remotest Periods of History---Of the Lapidaries among the Israelites ---Nature of the Stones selected by Moses for the Breast-plate of Aaron.

C. 1. *O.* 2. *G.* 2.

SPECIES I.

274. ALUMINE *with Water.*

VARIETY:

275. Wavellite---supposed to be Zeolite---Matrix in which it appears---its further Analysis by DAVY ---common Appearance---Colour---Texture--- exceeding Hardness --- effect of Water, as a Chemical Ingredient.

276. Diaspore---its Local History unknown---remarkable Property which caused its Name--- Analysis by VAUQUELIN---Specific Gravity.

C. 1. *O.* 2. *G.* 2.

SPECIES II.

277. ALUMINE *with Silex.*

278. General Observations concerning the Phænomena resulting from this Combination---various coloured Gems --- Observations of ROME DE L'ISLE --- of HAUY --- WERNER, and LAMETHERIE.

279. Discovery of the Corundum Stone --- Observations of BLACK --- of GREVILLE, and BOURNON --- Distinctions of *perfect* and *imperfect Corundum.*

VARIETY:

280. Telesia---Accidents of Colour---Oriental Ruby --- Sapphire --- Topaz --- Oriental Amethyst --- Oriental Chrysolite --- superior Hardness of Telesia --- Phosphorescence --- Specific Gravity --- Primitive Form --- Texture of Telesia --- Distinction between Telesia and Corundum, authorized by the Analysis of KLAPROTH.

281. Corundum---Adamantine Spar---Corundum of the Carnatic---China---Ava---Coast of Malabar

--- usual Form of its Crystals --- Hexagonal Prisms of Corundum, terminated by Hexahedral Summits---Analysis of Corundum by CHENEVIX and by KLAPROTH.

282. Emery---Discovery of TENNANT---Isle of Naxos ---PLINY's Observations concerning this Mineral.

283. Cymophane --- its various Appellations --- its common Appearance, and Crystalline Forms--- double Refraction --- how distinguished from Telesia---Opalescence---Fracture---confounded with Chrysolite---how distinguished from each other---uncertain Descriptions of Cymophane.

284. Topaz---Origin of its Name---Occidental Ruby Occidental Topaz---Occidental Sapphire---Of the terms *Oriental* and *Occidental,* as applied to Gems---Associations of Topaz---Subdivision of Secondary Forms in Topaz.

285. Of the Stone called Topaz by the Antients--- WERNER---PLINY---Statue of Arsinoe, Wife of Ptolemy Philadelphus --- PLUMTRE's Conjecture respecting the Origin of a Passage in SHAKESPEARE --- its Confirmation and further Illustration by MALONE.

286. Topaz of the Moderns---its Colour---Hardness --- Specific Gravity --- double Refraction ---- Electricity --- Infusibility.

287. Of the Change effected in Topaz by the Application of Heat---Exhibition of Topazes altered by Fire---Rubies of Constantinople.

288. Of Red, Blue, and Green Topazes---Distinction between Topaz and Yellow Emerald---between Topaz and Yellow Telesia---Other Distinctions ---False Topaz---Yellow Quartz---Process by which Black Quartz assumes a Topaz Hue---Topazes of the Ural Alps, and Oriental Siberia, or Daouria.

289. Schorlite---confounded with Red Tourmaline---Different Appearances of Schorlite---Prismatic White Schorl---Schorlaceous Beryl---Leucolite ---Pyncite---how distinguished from Emerald, Amphibole, Actinote, Pyroxene, Epidote, and Tourmaline---Places in which this Mineral is found.

290. Fibrolite---Bournon---its Colour---Hardness---Specific Gravity---Texture, and Infusibility.

291. Nephiline---White Hexahedral Schorl---Cause of Hauy's Appellation---Sommite---confounded with Feldspar---its Associations---how distinguished from Schorlite, and from Apatit.

C. 1. *O.* 2. *G.* 2.

SPECIES III.

292. ALUMINE *with Silex and Magnesia.*

VARIETY:

293. Spinelle---different Results in its Analysis by VAUQUELIN---and by KLAPROTH---Octahedral Ruby---Balass Ruby---where found---Mode of estimating its Price---Distinction between Spinelle and Telesia---between Spinelle and burned Topaz.

294. Ceylonite---Pleonaste---Manner in which this Mineral is found---its Associations---Form of its Crystals---its occasional Resemblance to Spinelle, and to Garnet---Mode of distinguishing these Minerals---Colour and Fracture of Ceylonite.

C. 1. *O.* 2. *G.* 2.

SPECIES IV.

295. ALUMINE *with Silex and Oxide of Iron.*

VARIETY:

296. Tourmaline---Electric Schorl---Black Schorl---Electric Tourmaline---its essential Character---different Notions thereupon---Dandradra---

Specific Gravity according to HAUY — and according to ECKEBERG — placed with Ores of Zinc, by BRONGNIART—Reasons for classing it among the Earths.

C. 1. *O.* 2.

GENUS III.

306. **MAGNESIA.**

SPECIES I.

307. MAGNESIA *with Silex and Alumine.*

VARIETY:

308. Iade—Nephritic Stone—Circumcision Stone—of the cutting Instruments in use among antient and barbarous Nations—Axe-Stone—Igiada—where found—Talisman of the Turks—Manufacture at Constantinople, and Caïro—False Iade—Green Marble of Corsica—Imaginary Virtues of Iade — BOËCE DE BOOT — Analysis by HÆPNER.

C. 1. *O.* 2. *G.* 3.

SPECIES II.

309. MAGNESIA *with Silex, Alumine, and Oxide of Iron.*

VARIETY:

310. Comolite—Lapis Ollaris—Talc—Pot-Stone—PLINY's Notice of its antient Quarries—Culinary Vessels of the Romans—District of Vallais—Reasons for the Name assigned to this Mineral.

311. Chlorite—THOMSON's Opinion concerning the Substance so called—placed with Mica by BOURNON—its Appearance in Nature—Form of its Scales viewed through a Lens—common Amorphous Chlorite—its Associations—Chlorite Schiefer.

C. 1. *O.* 2. *G.* 3.

SPECIES III.

312. MAGNESIA *with Silex and Oxide of Iron.*

VARIETY:

313. Chrysolite—its Locality unknown—Jewel Market of Constantinople—KLAPROTH—HAWKINS—confounded with Green Tourmaline—Peridot

—its double Refraction—little Estimation in which it is held by Oriental Lapidaries—Topaz of the Antients.

314. Of Olivine, or Granular Chrysolite—Basalt of Vivarais—Bohemia—Hesse—Hungary—Rhine—Lava of Ætna—Péperino of Rome—Mass of Siberian Native Iron.

C. 1. *O.* 2.

GENUS IV.

315. **ZIRCONIA.**

316. Of the Name given to this Earth—Jargon of Ceylon—its Colour, and remarkable Specific Gravity—Suspicion entertained of its real Nature.

C. 1. *O.* 2. *G.* 4.

SPECIES I.

317. ZIRCONIA *with Silex.*

VARIETY:

318. Zircon—Hyacinth—Cause of various Appellations given to this Mineral—various Appearances of the Dodecahedron—Secondary Forms of Zircon deduced from the Primitive, and illustrated by Models—Mode of distinguishing

Zircon from all other Minerals under the Name of Gems—Of Oriental and Occidental Hyacinth —Place and Manner in which Zircon is found— False Diamond.

C. 1. *O.* 2.

GENUS V.

319. ## YTTRIA.

320. Manner in which this Earth was discovered— Gadolin—ECKEBERG.

C. 1. *O.* 2. *G.* 5.

SPECIES I.

321. YTTRIA *with Silex and Oxide of Iron.*

VARIETY:

322. Gadolinite—where found—its Associations— its unique Appearance, Colour, and Fracture— Analysis by KLAPROTH—Magnetic Quality— how distinguished from Obsidian—and from Pechblende.

End of the First Class, comprehending all those Substances in which an EARTH *predominates.*

CLASS II.

323. METALS.

324. General Observations concerning the predominating elementary Principle of this Class—its natural Developement—Atmospheric Depositions.

325. Conspicuous Properties of Metals—Distinction between Mineral Brilliance and Metallic Lustre—of the First Metallurgists—Opacity, Fusibility, and superior Specific Gravity of Metals—their Property as Electrical Conductors — Relative Hardness—Malleability—Ductility—Tenacity.

326. Of the Decomposition of Oxygen Gas by means of Metals, and the Formation of Metallic Oxides.

327. Other Combinations of Metals — with Combustibles—and with each other.

328. Enumeration of Metals yet discovered—Allegoric Nomenclature of the Alchemists.

329. Of Metallic Ores — Different States in which Metals naturally appear.

ORDER I.

330. *Ductile Metals.*

GENUS I.

331. **GOLD.**

332. Why placed first in the Arrangement of Metallic Bodies—its great Antiquity in the Arts—Tombs of Antient Greece—Discovery made by Earl ABERDEEN near Athens—universal Dispersion of this Metal—probable Cause of the inconsiderable Bulk it appears to occupy in Nature—Mode of its existence—its Associations—remarkable Localities.

333. Weight, Malleability, Ductility, and Tenacity of Gold—its Volatilization—Incorruptibility—how affected by Arsenic—Affinity for Mercury.

SPECIES I.

334. GOLD *with minute Proportions of Silver or Copper.*

VARIETY:

335. Native Gold—its Alloys—Native Gold of Ireland—Colours of Native Gold—its common, and

remarkable Associations—Crystalline Forms—Rarity of some of them—Cubic Gold—Auriferous Pyrites—common Ores of Gold—Wash Gold—Gipsies of Transylvania—Negroes of Africa.

336. Gold of Hungary—Process of obtaining it at Schemniz and Cremniz—Gold Ores of Transylvania—Germany—France—Spain—Italy—Switzerland—Sweden—Siberia—different Parts of Africa—Mexico—Peru—Brazil—Gold Mines of the Antients.

C. 2. *O.* 1.

GENUS II.

337. **PLATINUM.**

338. Origin of the Name given to this Metal—History of its Discovery—Ulloa—Wood—its Locality—Associations—Infusibility—Use in the Arts.

C. 2. *O.* 1. *G.* 2.

SPECIES I.

339. PLATINUM *with Palladium, Rhodium, Iridium, Osmium, and minute Proportions of other Metals.*

VARIETY:

340. Native Platinum — granular and mixed State in which it is found—its Localities—Extraneous Bodies by which it is accompanied — Analysis by WOLLASTON, and by TENNANT—Grey Silver Ore of Guadalcanal—VAUQUELIN.

C. 2. *O.* 1.

GENUS III.

341. ## SILVER.

342. Great Antiquity of its Discovery—Opinions of BRONGNIART, and of PATRIN, concerning this Metal — Mode of ascertaining its Presence in Metallic Ores—its Tarnish what—Combinations —principal Mines of Silver.

C. 2. *O.* 1. *G.* 3.

SPECIES I.

343. SILVER *with very minute Proportions of other Metals.*

VARIETY:

344. Native Silver—its numerous Mineral Associations —Localities—Norway—Siberia—Hartz—Spain

—France—enormous Masses found at Kongsberg and Schneeberg—its Crystalline Forms.

345. Of the Silver Ore, in Form of Tinder, or Amadou.

C. 2. O. 1. G. 3.

SPECIES II.

346. SILVER *with Gold.*

VARIETY:

347. Auriferous Native Silver—its Rarity—Localities—Analysis by FORDYCE.

C. 2. O. 1. G. 3.

SPECIES III.

348. SILVER *with Antimony.*

VARIETY:

349. White Silver Ore—its Resemblance to Native Silver—how distinguished from that Mineral—where found—its Associations—Amorphous and Crystalline Forms—Analysis by VAUQUELIN.

C. 2. O. 1. G. 3.

SPECIES IV.

350. SILVER *with Arsenic.*

VARIETY :

351. Arsenical Silver Ore—its perfect Resemblance to Native Silver—Rarity of the Specimens—KLAPROTH — HAUY — KIRWAN — DE BORN — Smell of Garlic not always a Test of the Presence of Arsenic — Analysis of Specimens from Andreasberg—their Matrix—Associations.

C. 2. O. 1. G. 3.

SPECIES V.

352. SILVER *with Sulphur.*

VARIETY :

353. Vitreous Silver—Sulphuret—various Names of this Mineral—its remarkable external Characters — Appearance resulting from its Exposure to Heat—its Crystalline Forms—Manner in which it is deposited—Medals wrought in its unreduced State—its Localities, and most usual Matrix—supposed Origin of Native Silver.

354. Black Silver—Sooty Silver—Silver Black—Silver Mulm — component Parts not yet accurately

determined—Opinion of THOMSON—of HAUY—Description of its Texture and external Characters—its Crystalline Forms—Associations—Localities.

C. 2. O. 1. G. 3.

SPECIES VI.

355. SILVER *with Sulphur, Antimony, and Iron.*

VARIETY:

356. Antimoniated Sulphuret of Silver—where found—its external Characters—Localities—Specific Gravity—Analysis by KLAPROTH.

C. 2. O. 1. G. 3.

SPECIES VII.

357. SILVER *with Sulphur and Copper,*

VARIETY:

358. Cupriferous Sulphuret of Silver — Korbolinski Mountains—RENOVANTZ—Analysis by THOMSON—its Form—Colour—peculiar Character.

C. 2. O. 1. G. 3.

SPECIES VIII.

359. SILVER *with Antimony, Sulphur, and Oxygen.*

VARIETY:

360. Red Silver—Antimonial Sulphuret—its splendid and beautiful Appearance—various Circumstances of Colour and Form—decomposed by Light and the Action of the Atmosphere—its Fracture—Primitive Form — Similarity of its Secondary Forms to those of Carbonated Lime—Analysis by VAUQUELIN — its Resemblance to other Minerals—Manner of its Distinction—Opinion of PROUST concerning its component Parts—and of THENARD respecting its colouring Principle—Cause of its occasional Sombre Appearance —BRONGNIART'S Enumeration of its principal Crystalline Forms—Localities of this Mineral—its Matrix and Associations — Caution to be observed in placing it with other Minerals.

C. 2. *O.* 1. *G.* 4.

SPECIES II.

369. MERCURY *with Silver.*

VARIETY:

370. Native Amalgam — its Resemblance to Native Silver—how distinguished from that Mineral—decomposed by Heat—its Crystalline Forms—Rarity of such Appearances—other Forms of Native Amalgam—its Fracture—Proportion of its component Parts, according to CORDIER—its Localities—Substance in which it is found.

C. 2. *O.* 1. *G.* 4.

SPECIES III.

371. MERCURY *with Sulphur.*

VARIETY:

372. Native Cinnabar—Uniformity of its Colour—Method of distinguishing it from all other Minerals which it resembles—Specific Gravity when pure—Crystalline Forms—Primitive Form.

373. Compact Native Cinnabar—Fibrous—Pulverulent—Flowers of Cinnabar—Native Vermillion—Hepatic Cinnabar—Bitumeniferous Sulphuret—Mines of Idria.

C. 2. *O.* 1. *G.* 4.

SPECIES IV.

374. MERCURY *with Muriatic Acid.*

VARIETY:

375. Horn Quicksilver — how distinguished from Horn Silver—Description of its Forms, Amorphous and Crystalline — Proportion of its component Parts — Localities and Associations of this Mineral.

C. 2. *O.* 1.

GENUS V.

376. **COPPER.**

377. Its antient Name — Etymology of the Term— its remote Antiquity in the Arts—Knives of the antient Egyptians—Armour during the Trojan War—Composition of antient Bronze—important Uses to which Copper is applied—Brass—Pinchbeck — its Sonorous Property — Wind-Instruments—Bell Metal—Difficulty of Fusion —Hardness—Facility of Combination with other Metals—Action of Humidity upon Copper —

Verdigris—Mode of ascertaining the Presence of Copper in all Minerals.

378. Three Modes in which Copper Ores are deposited.

379. Nature of the First Deposit—Mine of Fahlun, in Sweden—remote Period of its Exploration—Mine of Anglesea—Mines of Cornwall.

380. Nature of the Second Deposit—Mines of Hesse—Animal Impressions—European and Asiatic Copper.

381. Nature of the Third Deposit—Mines of Siberia—Vegetable Impressions—Mineralised Wood—Specimen in the Museum at Petersburg—General Observations respecting the Position of Mountains in all the Parts of the Globe—Principal Mines of Copper.

C. 2. *O.* 1. *G.* 5.

SPECIES I.

382. COPPER *uncombined.*

VARIETY:

383. Native Copper—Virgin Copper Ore—its various and beautiful Appearances—different Countries whence they are severally derived—Shape of its

Crystals—Origin of Stalactite Native Copper—Minerals in which it is found.

C. 2. *O.* 1. *G.* 5.

SPECIES II.

384. COPPER *with Arsenic.*

VARIETY:

385. White Copper Ore of Freyberg — Arsenical Copper—by whom first described—Manner of its Occurrence—its Rarity—THOMSON—KIRWAN BROCHANT.

C. 2. *O.* 1. *G.* 5.

SPECIES III.

386. COPPER *with Sulphur and Iron.*

VARIETY:

387. Vitreous Copper Ore—Sulphuret—its Fracture and Colour — extreme Fusibility — how distinguished from Sulphuret of Silver—Primitive Form — Analysis by KLAPROTH — Common Appearance—Rarity of its Crystalline Form—purest and richest of the Ores of Copper—its Localities.

388. Pyritous Copper—how distinguished from Iron Pyrites—its Primitive and Secondary Forms—Concretions—Stalactites—its Proportion of Iron variable—its great Abundance—small Proportion of Copper—most common of all the Cupreous Ores—its partial Decomposition—Peacock Ore—Hepatic Pyritous, or Variegated Copper Ore—KLAPROTH—Opinion of THOMSON concerning the Mineral called Black Copper Ore.

C. 2. *O.* 1. *G.* 5.

SPECIES IV.

389. COPPER *with Arsenic, Iron, Sulphur, and sometimes Silver.*

VARIETY:

390. Grey Copper Ore—FAHLERZ—Grey Silver—*Arsenical Grey Copper* of BRONGNIART—Difficulty of distinguishing it from Antimonial Grey Copper—confounded by almost all Mineralogists—Marks of their Distinction—Separation authorised by the Analysis of KLAPROTH—Characters common to both.

C. 2. *O.* 1. *G.* 5.

SPECIES V.

391. COPPER *with Antimony, Iron, Sulphur, and sometimes Silver.*

VARIETY:

392. Grey Copper Ore — FAHLERZ — Grey Silver — *Antimonial Grey Copper* of BROGNIART — its great Resemblance to the Variety of the last Species — variable and accidental Proportion of Silver in certain Specimens of either—Situation in Nature—their various and beautiful Associations—Matrix—Locality.

C. 2. *O.* 1. *G.* 5.

SPECIES VI.

393. COPPER *with Oxygen.*

VARIETY:

394. Ruby Copper — its occasional Resemblance to other Minerals—easy Method of ascertaining its real Nature — Ruby Copper of Cornwall — its Constituents, according to CHENEVIX — Crystalline Forms—Rarity of the Cubic—where that Form has been observed—other Appearances—

Capillary — Amorphous — Pulverulent — its remarkable Associations — Inference induced by those Phænomena—Localities.

395. Arseniferous Ruby Copper — Ferriferous Ruby Copper.

C. 2. O. 1. G. 5.

SPECIES VII.

396. COPPER *with Carbonic Acid, Oxygen, and Water.*

VARIETY:

397. Azure Copper—Blue Carbonat—Characters of this beautiful Mineral—its Primitive Form—Of the Substance called Mountain Blue — Earth which combines with it—Analysis of Crystals of Copper Azure, by PELLETIER—Radiated Blue Carbonat—Concretions—Laminary—Granular—Amorphous—its Associations—Matrix in which it constantly appears.

398. Malachite — Green Carbonat — not a distinct Species ---- Comparison of the Analysis of KLAPROTH, and PELLETIER — Observations on the Notice of BRONGNIART, concerning the Constituents of the preceding Variety—Colour

no Criterion of specific Distinction—Examples—distinguishing Characters of Malachite—Opinions respecting its Crystallization—Reference to the Crystallization of Alabaster—how distinguished from Muriat of Copper—and from Uranite—Fibrous Malachite—Green Sattin Copper Ore—extraordinary Beauty of certain Specimens—Concretionary Forms—magnificent Specimens at Moscow and Petersburg—Chrysocolla—Ferruginous Malachite.

399. Varieties of this Species, in the same Specimen, intimately combined—De Born—Similar Appearances in other Minerals, formerly separated—Chalcedony.

400. Locality of the finest Malachite—Extraneous Fossils mineralized by the Blue and Green Carbonats of Copper—Appellations bestowed on such Appearances.

401. Phænomena which tend to illustrate the Natural History of the Nineteenth Species of the First Class.

C. 2. O. 1. G. 5.

SPECIES VIII.

402. COPPER *with Oxygen, Muriatic Acid, and Water.*

VARIETY:

403. Green Sand of Peru—Muriat—recent Discoveries of its massive and Crystalline Forms — superb Specimens from Chili—Form of the Crystals—their Matrix — Associations — Locality — how distinguished from Arseniated and from Carbonated Copper—Muriated Copper of Vesuvius.

C. 2. O. 1. G. 5.

SPECIES IX.

404. COPPER *with Oxygen and Phosphoric Acid.*

VARIETY:

405. Green Phosphat of Copper—uncertain Knowledge of this Mineral—its external Characters—Analysis by KLAPROTH — where found — its Associations—Matrix.

C. 2. *O.* 1. *G.* 5.

SPECIES X.

406. COPPER *with Oxygen, Arsenic Acid, and Water.*

VARIETY:

407. Arseniated Copper — Blue — Green — Brown — Olive Ore of Copper — Fallibility of specific Distinction founded on external Character — Chemical Properties common to all the Varieties.

408. Obtuse Octahedral Arseniat—Colour—supposed by HAUY the Primitive Form — Analysis by CHENEVIX—Specific Gravity.

409. Laminary Arseniat—Colour—Form—Hardness — Texture — Specific Gravity — Analysis by CHENEVIX, and by VAUQUELIN.

410. Acute Octahedral Arseniat—BOURNON—Colour — Hardness — Specific Gravity — Analysis by CHENEVIX—without Water of Crystallization.

411. Trihedral Arseniat—HAUY—BOURNON—Colour and Crystalline Form of this rare Variety — Model of the Prisms—Specific Gravity.

412. Capillary Arseniat—its various Colours—Texture — Analysis by CHENEVIX — KLAPROTH — VAUQUELIN.

413 Mamillary Arseniat---Disposition of its Colours ---Resemblance to Wood Tin---subject to Decomposition---Analysis by CHENEVIX.

414. Ferriferous Arseniat --- its Colours --- unique Form hitherto observed --- Specific Gravity --- constituent Parts.

415. Associations and Localities of the Varieties of Arseniated Copper.

C. 2. *O.* 1.

GENUS VI.

416. **IRON.**

417. Vast Abundance of this Metal proportioned to its Importance---its Providential Distribution--- Torrid---Temperate---Frigid, Zones---peculiar Properties --- universal Prevailment --- Specific Gravity --- Contrast between its Natural and Artificial State---Scriptural Account of Iron--- Antediluvian Artificers---when first known in Greece---its Value during the Trojan War--- Colours it communicates---Characters common to all its Ores---its Combinations---Reasons for removing Iron Pyrites and Spathose, or Sparry Iron, from this Class --- Principal Mines of Iron.

C. 2. *O.* 1. *G.* 6.

SPECIES I.

418. IRON *with Nickel.*

VARIETY:

419. Native Iron---how distinguished from Wrought Iron—Meteoric Iron—Tartary—South America ---Africa---Bohemia---Croatia---Mineral Native Iron---France---Saxony---America.

C. 1. *O.* 2. *G.* 6.

SPECIES II.

420. IRON *with Arsenic.*

VARIETY:

421. Mispickel --- *Common Arsenical Pyrites* of BROCHANT---Arsenical Iron---Colour---Fracture ---Odour exhaled when it gives Sparks to the Steel---its Primitive, and Secondary Forms--- Difficulty of distinguishing it from Arsenical Cobalt --- Grey Cobalt --- and Antimonial Silver ---how distinguished from *Arsenical Pyrites*--- its Situation in Nature --- Localities --- easily confounded with Arsenical Sulphuret of Iron

---Argentiferous Arsenical Iron---other Metals found occasionally in this Variety.

C. 2. *O.* 1. *G.* 6.

SPECIES III.

422. IRON *with Oxygen.*

423. Extensive Character of this Species---superfluous Distinctions from Accidents of Colour.

VARIETY:

424. Magnetic Iron Stone --- Loadstone --- external Characters --- Primitive Form --- peculiar Characters --- Amorphous --- Fibrous --- Arenaceous ---Polarity---Localities.

425. Specular Iron Ore --- Oligistine Iron --- how distinguished from the preceding Variety --- Primitive Form, combined with the Cube--- Amorphous---Lenticular---Laminary---Scaly, or Micaceous --- various Crystalline Forms --- its Situation in Nature---Localities.

426. Red Iron Stone---Red Hæmatites---Concretions ---Stalactites---casual Forms---Names in consequence---Cylindric---Mamillary---Red Ochre.

427. Brown Iron Ore---Brown Scaly Iron Ore--- Compact Brown Iron Ore---Brown Hæmatites ---Brown Ochre.

428. Of Pseudo-Crystals on Stalactites of Iron Oxide.

429. Black Iron Ore---Rarity of this Appearance---Black Hæmatites.

430. Argillaceous Iron---Poverty as an Ore---why preferred in England---Red Crayon---Granular Argillaceous Iron Ore---Kidney-Form Iron Ore---Ætites---Eagle-Stone---Pisiform Iron Ore---Bog Iron Ore---Meadow Low-Land Ore---Swampy Iron Ore---Morassy Iron Ore.

C. 2. *O.* 1. *G.* 6.

SPECIES IV.

431. IRON *with Arsenic Acid, Oxygen, Copper, Water, and Silex.*

VARIETY:

432. Green Cubic Iron---Arseniat---external Characters of this beautiful and rare Mineral---various Accounts of its Analysis---its Matrix---Locality.

C. 2. *O.* 1. *G.* 6.

SPECIES V.

433. IRON *with Phosphoric Acid, Oxygen, and Manganese.*

VARIETY:

434. Native Prussian Blue—Iron Azure—Phosphat—Laminary—Pulverulent—its peculiar Situation—incomplete Analysis—KLAPROTH—FOURCROY—PROUST.

C. 2. *O.* 1. *G.* 6.

SPECIES VI.

435. IRON *with Sulphuric Acid.*

VARIETY:

436. Native Green Vitriol—Green Copperas—Form which it assumes in Nature—how distinguished from Sulphat of Alumine—Difference between Natural and Artificial Sulphat of Iron—Origin of the Combination—Substances which form with it a Mineral Aggregate.

C. 2. *O.* 1. *G.* 6.

SPECIES VII.

437. IRON *with Oxygen, Chromic Acid, and Alumine.*

VARIETY:

438. Chromat of Iron—its recent Discovery—external Characters—Infusibility—Circumstance which identifies it under any Form it may assume—Analysis by VAUQUELIN—Locality.

C. 2. *O.* 1. *G.* 6.

SPECIES VIII.

439. IRON *with Oxygen and Carbonic Acid.*

VARIETY:

440. Spathose, or Sparry Iron — Metallic Spar — Ferriferous Carbonated Lime—White Iron Ore — Substances which *accidentally* enter the Combination — Structure and Colour — same Primitive Form as Carbonated Lime — how distinguished from Brown Spar—its most recent Analysis by BUCHOLZ, DESCOTILS, and DRAPPIER —Secondary Forms peculiar to itself—Situation —Locality—Reasons for removing it from the First Class—its Importance as an Ore.

C. 2. *O.* 1.

GENUS VII.

441. **TIN.**

442. Mentioned in the Ordinances of the Levitical Law—Common in the Holy Land two Centuries and a half before the Christian Æra—Commerce of the Phœnicians—Cassiterides—Characters of this Metal—Putty—Easy Method of ascertaining the Presence and Quantity of Arsenic in its Ores — its Combinations — Bronze — Metal of Cannon—Bell-Metal—ΧΑΛΚΟΣ of the Greeks —Cutting Instruments of the Antients—Nails from the Tomb of Agamemnon, at Mycenæ—their Analysis by HATCHETT—GELL—Medals of the Antients—Telescope Mirrors.

443. Extreme Rarity of this Metal in Nature—its Situation when discovered—Matrix—Principal Mines.

C. 2. *O.* 1. *G.* 7.

SPECIES I.

444. TIN *with Oxygen.*

VARIETY:

445. Tin Stone—Tin Ore—external Characters—its Crystalline and Primitive Form—Analysis by KLAPROTH—Fibrous Tin Ore—Tin Stalactite—Wood Tin—Concretionary Texture—Infusibility—Locality—Tin Stalactite of Mexico—Associations of Tin—Stream Tin.

C. 2. *O.* 1. *G.* 7.

SPECIES II.

446. TIN *with Sulphur and Copper.*

VARIETY:

447. Pyritous Tin—Difficulty of identifying this rare Mineral—Colour—Lustre—Fracture—Specific Gravity—Chemical Characters—Proportion of its Constituents according to KLAPROTH—where found.

C. 2. *O.* 1.

GENUS VIII.

448. **LEAD.**

449. History and Properties of this Metal—Notion of the Antients concerning it—Medals of Antient Greece—Combinations of Lead—its Abundance in Europe—Deficiency in Asia—Ural and Altaic Mountains — Profusion in Daouria — Of the Native Lead of Madeira—Reasons for not placing it in the System.

C. 2. *O.* 1. *G.* 8.

SPECIES I.

450. LEAD *with Sulphur.*

VARIETY :

451. Galena—Sulphuret—its remarkable Fracture—component Parts—Laminary—Granular—Compact—Striated—Crystallized—Primitive Form—Peacock Lead Ore.

452. Of Blue Lead Ore and Black Lead Ore — Opinions respecting their Origin.

453. Minerals commonly associated with Sulphuret of Lead.

C. 2. *O.* 1. *G.* 8.

SPECIES II.

454. LEAD *with Oxygen.*

VARIETY:

455. Earthy Lead Ore—not entitled to Class with simple Minerals.

C. 2. *O.* 1. *G.* 8.

SPECIES III.

456. LEAD *with Oxygen and Arsenic.*

VARIETY:

457. Yellow Silky Lead of St. Prix—its Matrix—other Localities—Arsenical Lead of Andalusia—Green Arsenical Lead.

C. 2. *O.* 1. *G.* 8.

SPECIES IV.

458. LEAD *with Oxygen and Carbonic Acid.*

VARIETY:

459. White Lead Spar—Carbonat—essential Character—double Refraction—powerful dispersive Property in Lead—Flint Glass—Primitive Form

— Analysis by KLAPROTH — how distinguished from Crystallized Carbonated Lime — superb Crystals from Oriental Siberia--Acicular Spathose Lead—Massive Carbonated Lead.

C. 2. *O.* 1. *G.* 8.

SPECIES V.

460. LEAD *with Muriatic Acid, and Carbonic Acid.*

VARIETY :

461. Murio-Carbonat of Lead — BOURNON — Colour and Primitive Form — Lustre — Fracture — Resemblance to precious Stones—Constituents according to KLAPROTH.

C. 2. *O.* 1. *G.* 8.

SPECIES VI.

462. LEAD *with Oxygen and Sulphuric Acid.*

VARIETY :

463. Snow-White Sulphat of Lead—where principally found—Crystalline Form—Analysis—how distinguished from Carbonat of Lead — Specific Gravity—other Localities.

C. 2. *O.* 1. *G.* 8.

SPECIES VII.

464. LEAD *with Oxygen, Phosphoric Acid, and a small Portion of Muriatic Acid.*

VARIETY:

465. Green Lead—Cause of its usual Colour—other Appearances — Association with the Fourth Species — its Powder — Crystalline Form—Resemblance to Emerald — Primitive Form — Description of a Variety containing Arsenic Acid —Circumstances attending its Decomposition—Localities.

C. 2. *O.* 1. *G.* 8.

SPECIES VIII.

466. LEAD *with Oxygen and Molybdic Acid.*

VARIETY:

467. Yellow Lead—Molybdat—by whom first described—Error of ROMÉ DE LISLE — Primitive Form—Secondary Forms—Colour—Texture—Fracture—Analysis by MACQUART.

C. 2. *O.* 1. *G.* 8.

SPECIES IX.

468. LEAD *with Oxygen and Chromic Acid.*

VARIETY:

469. Red Lead of Siberia—Chromat—extreme Rarity of this Mineral — when discovered, and by whom—its Locality—subsequent Disappearance —Matrix and Associations—Form of its Crystals —how distinguished from Sulphuret of Arsenic— and from all other Minerals of a Red Colour —Discovery made by VAUQUELIN during its Analysis—constituent Parts.

470. Brown Chromat of Lead of Mexico—HUMBOLDT —in what it differs from Red Chromat—its Analysis by DESCOTILS.

C. 2. *O.* 1. *G.* 8.

SPECIES X.

471. LEAD *with Oxygen, and Oxide of Chromium.*

VARIETY:

472. Green Chromal Lead—how distinguished from Green Phosphat of Lead—Manner of its Appearance — its remarkable Association with

Chromated Lead—Opinion respecting its Constituents—BRONGNIART.

C. 2. *O.* 1.

GENUS IX.

473. ## NICKEL.

474. Recent Discovery concerning this Genus — Authority for its Situation in this Order—Colour when pure — its great Malleability — small Quantity in which it exists—Situation—Association—Magnetism—Difficulty of obtaining it pure—Action of Air—Chrysoprase.

C. 2. *O.* 1. *G.* 9.

SPECIES I.

475. ### NICKEL *with Arsenic.*

VARIETY:

476. Kupfer Nickel—Arsenical Nickel — mistaken for Copper Ore—Cronstadt—Arsenical Nickel — distinguished from Native Copper — Odour when struck with Steel — not Crystallized — Manner in which it appears — its Matrix — Localities.

C. 2. *O.* 1. *G.* 9.

SPECIES II.

477. NICKEL *with Oxygen.*

VARIETY:

478. Nickel Ochre—its unique Appearance—Minerals on which it is observed — how distinguished from Green Oxide of Copper—Chrysoprase of KOSEMÜTZ—Pimelite.

C. 2. *O.* 1. *G.* 9.

SPECIES III.

479. NICKEL *with Arsenic Acid, Cobalt, and Alumine.*

VARIETY:

480. Arseniat of Nickel—distinct Species from Arsenical Nickel—THOMSON—where and by whom found—Characters of the Mineral—Opinion of THOMSON concerning the Green Efflorescence, or Kupfer Nickel.

C. 2. *O.* 1.

GENUS X.

481. ### ZINC.

482. Æra in which this Metal became known—never found pure — Colour — Texture — its Combinations—general Character of its Ores—Amalgam for Electrical Machines — Brass — Pinchbeck—CADMIA of the Antients.

C. 2. *O.* 1. *G.* 10.

SPECIES I.

483. ZINC *with Sulphur and Iron.*

VARIETY:

484. Blende—Sulphuret—Various Appearances under which this Combination is presented — how distinguished from Sulphuret of Lead—its Uses —Phosphorescence—Easy Transition from the Secondary to the Primitive Form — common Forms — Yellow Blende — Brown Blende — Black Blende—Compact Blende—Habitudes—Localities.

C. 2. *O.* 1. *G.* 10.

SPECIES II.

485. ZINC *with Oxygen and Silex.*

VARIETY:

486. *Calamine*—Abuse of the Term—Electricity—Primitive Form—Specific Gravity—its Action before the Blow-Pipe—and in Acids—whence Specimens are derived in which this peculiar Combination resides—Nature of their Formation.

C. 2. *O.* 1. *G.* 10.

SPECIES III.

487. ZINC *with Oxygen and Carbonic Acid.*

VARIETY:

488. *Calamine*—Carbonat—by whom the Combination was discovered—English Calamine—how distinguisned from Silicated Zinc.

C. 2. *O.* 1. *G.* 10.

SPECIES IV.

489. ZINC *with Oxygen, Carbonic Acid, and Water.*

VARIETY:

490. *Calamine*—Hydrous Carbonat—how distinguished from the Variety of the last Species—

Peculiarity of its Form—where found—Analysis by SMITHSON.

C. 2.

ORDER II.

491. *Not Ductile.*

GENUS I.

492. **BISMUTH.**

493. Confounded by the Antients with Tin—Notions of the early Alchemists—when first noticed as a peculiar Metal—Nature of the Strata in which it is discovered — Structure — Specific Gravity — Fusibility — Artificial Process for obtaining Crystals of Bismuth—and of all other Metals.

C. 2. O. 2. G. 1.

SPECIES I.

494. BISMUTH *with a small Portion of Cobalt, or Arsenic.*

VARIETY:

495. Native Bismuth—its external Character—Mode of detecting its Presence when concealed by its

Matrix — Habitude — Associations — Localities — Structure—Crystalline and Primitive Forms — Fusibility.

C. 2. O. 2. G. 1.

SPECIES II.

496. BISMUTH *with Sulphur.*

VARIETY:

497. Common Sulphuret — Laminary — Acicular — Difficulty of ascertaining this Ore — its most striking Characters—Primitive Form—Analysis by SAGE—not to be confounded with Sulphuriferous Native Bismuth—Localities.

C. 2. O. 2. G. 1.

SPECIES III.

498. BISMUTH *with Oxygen.*

VARIETY:

499. Bismuth Ochre—how distinguished from Nickel and Copper Oxides — its Insignificance as a Mineral—Rarity—Manner in which it appears.

C. 2. O. 2.

GENUS II.

500. ## ANTIMONY.

501. Use of this Metal among Oriental Women—Second Book of Kings — EZEKIEL — PLINY—Earliest Analysis of Antimonial Ores—Medical Properties — Colour — Texture — Countries in which it abounds—Characters which distinguish it from other brittle Metals.

C. 2. O. 2. G. 2.

SPECIES I.

502. ANTIMONY *with a small Portion of Silver.*

VARIETY :

503. Native Antimony—where found—mistaken for Arsenical Pyrites—Form in which it appears—Visible Nature of its Formation—Proportion of its Constituents according to KLAPROTH.

C. 2. O. 2. G. 2.

SPECIES II.

504. ANTIMONY *with Sulphur.*

VARIETY:

505. Grey Antimony — Sulphuret — its remarkable Tendency to Crystallization ---- Difficulty of ascertaining the Form of its Prisms—Brittleness —Fusibility—how distinguished from Acicular Oxide of Manganese.

506. Pure Sulphuret—Compact—Laminary—Radiated —Analysis by BERGMAN and PROUST.

507. Association of Antimony with Native Gold— Transylvania—Daouria—Spain.

508. Capillary Sulphuret — Substances accidentally combined — where found—Argentiferous Sulphuret of HAUY—Antimonial Grey Silver of ROMÉ DE LISLE.

C. 2. O. 2. G. 2.

SPECIES III.

509. ANTIMONY *with Oxygen.*

VARIETY:

510. White Antimony—mistaken for Muriat of Antimony—KIRWAN—DAUBENTON--DELAMÉTHERIE

—its Characters — Associations — Localities — Analysis by KLAPROTH.

511. Yellow Pulverulent Oxide—Ochre of Antimony —Opinion of PROUST concerning its Origin— where found—Mode of its Appearance.

C. 2. O. 2. G. 2.

SPECIES IV.

512. ANTIMONY *with Oxygen and Sulphur.*

VARIETY:

513. Red Antimony — Hydro-sulphuret — Plumose Antimony—other various Names—Characters— Forms — Acicular — Analysis by KLAPROTH — Amorphous—Localities.

C. 2. O. 2.

GENUS III.

514. **TELLURIUM.**

515. Account of the Discovery of this Metal — its various Names — Notions concerning it — Resemblance to Antimony — Characters which distinguish it—Mines of Tellurium—its common Ore.

C. 2. O. 2. G. 3.

SPECIES I.

516. TELLURIUM *with Iron and Gold.*

VARIETY:

517. Native Tellurium — White Gold—Sylvanite—Substances accidentally combined with it—various Appearances of this Mineral.

518. Ferriferous Native Tellurium—its Analysis by KLAPROTH—Locality—Associations—Mines of Berezow, in Siberia.

519. Graphic Native Tellurium—its Prismatic Form—Constituents according to KLAPROTH — where found—its Situation in Nature.

520. Plumbiferous Native Tellurium—Grey Ore of Nagyag—Foliated Tellurium—Specific Gravity—Colour—Structure—Form of its Prisms—Analysis by KLAPROTH—singular Appearance when exposed to Heat.

C. 2. O. 2.

GENUS IV.

521. ARSENIC.

522. Mode of detecting its Presence in all its Ores—its Use among the Antients—DIOSCORIDES—

PARACELSUS—Discovery of its Metallic Nature—dangerous Effluvia—extreme Volatility—Crystallization—its Combinations.

C. 2. O. 2. G. 4.

SPECIES I.

523. ARSENIC *with Iron; often with Silver; and sometimes Gold.*

VARIETY:

524. Native Arsenic—its Characters—Concretionary—Testaceous Arsenic—Specular Native Arsenic—Amorphous — Scaly Arsenic — Habitudes — Localities.

C. 2. O. 2. G. 4.

SPECIES II.

525. ARSENIC *with Sulphur.*

VARIETY:

526. Realgar — Rubine — Sandarach — Colour — Fracture—how distinguished from Chromat of Lead—Electricity—Constituent Parts—Primitive Form — Fissures and Craters of Volcanoes — Massive Realgar — various Localities—Uses of Realgar—Medicinal Vases of the Chinese.

527. Orpiment—Yellow Realgar—its external Characters—often associated with the last Variety—Chemical Characters in which they differ—where found—its Uses—Rusma of the Turks.

C. 2. O. 2. G. 4.

SPECIES III.

528. ARSENIC *with Oxygen.*

VARIETY:

529. Native Oxide of Arsenic—Difference between Natural and Artificial Crystals of this Compound—Action of Combustible Bodies—Crystalline Forms — Pulverulent Oxide — its Rarity — Localities of Arsenic Oxide.

C. 2. O. 2. G. 4.

SPECIES IV.

530. ARSENIC *with Cobalt, Iron, and Sulphur.*

VARIETY:

531 False Names given to the Varieties of this Species — Arsenical Cobalt — Grey Cobalt — White Cobalt Ore—Reasons for assigning them a Place

among the Ores of Arsenic ---- Analysis of KLAPROTH — Mamillary Forms — Crystalline Forms.

532. Reason for placing Arsenical Pyrites, or Mispickel, with the Ores of Iron.

C. 2. O. 2.

GENUS V.

533. **COBALT.**

534. Peculiar characteristic Property of this Metal—Difficulty of Fusion—not found pure—Magnetic Property—Result of its Exposure to the Action of Air—by whom made known as a Metal—Origin of its Name—Association of its Ores—its Uses in the Arts—Mines of Cobalt.

C. 2. O. 2. G. 5.

SPECIES I.

535. COBALT *with Oxygen.*

VARIETY :

536. Black, Brown, and Yellow Cobalt Ore—Cause of the Difference of Colour—Mamillary Oxide—Earthy—Vitreous—Localities.

C. 2. O. 2. G. 5.

SPECIES II.

537. COBALT *with Arsenic Acid.*

VARIETY:

538. Red Cobalt Ore—Flowers of Cobalt—Peach-Blossom Ore---- Facility of recognising this Mineral — Acicular Arseniat — Pulverulent — Places in which it abounds.

C. 2. O. 2. G. 5.

SPECIES III.

539. COBALT *with Sulphuric Acid.*

VARIETY:

540. Native Vitriol of Cobalt—Sulphat—Red Stalactite of Cobalt—Transparency—where found.

C. 2. O. 2.

GENUS VI.

541. **MANGANESE.**

542. Extraordinary Dissimilitude in Substances of this Genus—general Character of the Ores—

Colouring Properties—Manufacture of Glass—Bergmann—Gahn—Affinity of Manganese for Oxygen—Uses—Localities.

C. 2. O. 2. G. 6.

SPECIES I.

543. MANGANESE *with Oxygen.*

VARIETY:

544. Radiated Grey Ore of Manganese—how distinguished from Grey Sulphuret of Antimony—Argentine Oxide—Compact Grey Ore—Stalactite Forms—Pulverulent Grey Ore—Localities.

C. 2. O. 2. G. 6.

SPECIES II.

545. MANGANESE *with Oxygen and Sulphur.*

VARIETY:

546. Black Ore of Manganese — Black Blende of Transylvania — Sulphuret — Analysis of Vauquelin—his Opinion respecting the Analysis of Klaproth—Brongniart—Characters—where found.

C. 2. O. 2. G. 6.

SPECIES III.

547. MANGANESE *with Oxygen, Oxide of Iron, and Phosphoric Acid.*

VARIETY:

548. Phosphat of Manganese—Phosphat of Iron, of Brochant—Characters of the Mineral in which this Combination resides—Opinion concerning its Primitive Form — Specific Gravity — its Impurity—Presence of Iron accidental—Analysis by VAUQUELIN—where found.

C. 2. O. 2. G. 6.

SPECIES IV.

549. MANGANESE *with Oxygen, Carbonic Acid, and Iron.*

VARIETY:

550. Red Ore of Manganese of Nagyag — White Ore of Manganese of Kapnic—Associations—Analysis by LAMPADIUS—BRONGNIART'S Statement of the Nature of those Ores—essential chemical Characters still undecided—RUPRECHT—Siberian Ore—Siliciferous Manganese.

C. 2. O. 2.

GENUS VII.

551. **TUNGSTEN.**

552. Name given by the French and Germans to this Metal—Pretensions to its Discovery by SCHEELE and BERGMANN—Cause of its present Appellation — Hardness — remarkable Specific Gravity — Difficulty of ascertaining its distinctive Characters —Associations of Tungsten—Localities.

C. 2. O. 2. G. 7.

SPECIES I.

553. TUNGSTEN *with Oxygen and Lime.*

VARIETY :

554. Tungspar—White Tin Ore—White Wolfram—Calcareous Scheelin—how distinguished from Barytes, Oxide of Tin, and Carbonat of Lead —Crystalline Forms—Analysis by KLAPROTH—Associations—Localities.

C. 2. O. 2. G. 7.

SPECIES II.

555. TUNGSTEN *with Oxygen, Manganese, and Iron.*

VARIETY:

556. Wolfram—Resemblance to certain Ores of Iron and Tin—how distinguished—Crystalline Form—Analysis by VAUQUELIN—Localities—extraordinary Association in Siberia.

C. 2. O. 2.

GENUS VIII.

557. **MOLYBDENUM.**

558. Its Metallic State unobserved in Nature—imperfectly reduced by Art—chemical Character of its Combinations—confounded with Plumbago—SCHEELE—HIELM.

C. 2. O. 2. G. 8.

SPECIES I.

559. MOLYBDENUM *with Sulphur.*

VARIETY:

560. Molybdena — Sulphuret — Amorphous — Crystalline Form — Colour — Electrical Property — how distinguished from Plumbago—Analysis by BUCKHOLZ — Situation in Nature — Matrix — Localities.

C. 2. O. 2.

GENUS IX.

561. **URANIUM.**

562. Account of its Discovery—extraordinary Dissimilitude in Substances which contain it — Difficulty of reducing its Ores — its inferior Specific Gravity—its unique Combination.

C. 2. O. 2. G. 9.

SPECIES I.

563. URANIUM *with Oxygen.*

VARIETY:

564. Pechblende — its Rarity — Locality — perfect Stalactite Form—Solubility in Acids—Colour—Fracture — Lustre — Infusibility — how distinguished from Sulphuret of Zinc—Proportion of its constituent Parts—Localities.

565. Uranite Ochre — Result of Decomposition — Manner of its Appearance — Pulverulent — Massive.

566. Green Mica—Micaceous Uranite—Crystalline Form—how distinguished from Oxide of Copper — occasional Mixture with that Metal — its various Matrices—different Places in which it is found.

C. 2. O. 2.

GENUS X.

567. **TITANIUM.**

568. Various Appearances under which it exists—ascertained only by chemical Experiments —

by whom discovered — little known of its Metallic State — Impurity of its Oxides — distinctive Characters.

C. 2. *O.* 2. *G.* 10.

SPECIES I.

569. TITANIUM *with Oxygen.*

VARIETY:

570. Titanite—Red Schorl—Hairs of Venus—Ruthile —known only in its Crystalline Form—Gradation of Colour—Hardness—Fracture—Infusibility—Primitive Form — bacillar Ruthile — reticular Ruthile—Sagenite—Crispite—Localities of this Variety.

571. Anatase—Oisanite—Octahedral Schorl—remarkable Difference in its external Characters with those of Titanite—considered often a distinct Species—BRONGNIART—Analysis by VAUQUELIN —Place in which it is found.

C. 2. O. 2. G. 10.

SPECIES II.

572. TITANIUM *with Iron and Silex.*

VARIETY:

573. Menachanite — Ferriferous Oxide — Substance which first led to the Discovery of this Genus—its external Characters—Analysis by KLAPROTH — Massive Menachanite — Gallitzinite — Menachanite of Transylvania.

C. 2. O. 2. G. 10.

SPECIES III.

574. TITANIUM *with Lime and Silex.*

VARIETY:

575. Nigrine—SPHENE—Pictite—its Primitive Form —varied Proportion of its constituent Parts—KLAPROTH—ABILDGÅÅRD—CORDIER—brought from the Molucca Isles by THUNBERG, as granular Tin—Superb Crystals from Arendahl in Norway—its various Localities.

C. 2. O. 2.

GENUS XI.

576. **CHROMIUM.**

577. By whom discovered—Cause of its Appellation—imperfect Knowledge of its Metallic Nature—characteristic Properties—Minerals in which it exists as an accessory Principle—Uses of Chromium in the Arts.

C. 2. O. 2. G. 11.

SPECIES I.

578. CHROMIUM *with Oxygen, Oxide of Iron, and Alumine.*

VARIETY:

579. Chromat of Iron—where found—Form in which it appears—Colour—Lustre—Hardness—Analysis by VAUQUELIN—Infusibility—more recent Analysis by LOWITZ and by LAUGIER—improperly placed with Ores of Iron.

C. 2. O. 2.

GENUS XII.

580. **COLUMBIUM.**

581. Genus, Species, and Variety, residing in a single Specimen—its Resemblance to the Chromat of Iron—Discovery of the Metal—Origin of the Name.

C. 2. O. 2. G. 12.

SPECIES I.

582. COLUMBIUM *with Oxygen and Iron.*

VARIETY:

583. Columbite—its Characters—Form—external and internal Colour—Lustre—Specific Gravity—where found—Analysis by HATCHETT.

C. 2. O. 2.

GENUS XIII.

584. **TANTALIUM.**

585. Imperfect Knowledge of this Metal—by whom discovered—Origin of the Name—Resemblance of its Oxide to that of Columbium.

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[illegible]. [illegible]

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C. 2. *O.* 2. *G.* 14.

SPECIES I.

592. CERIUM *with Oxygen and Silex.*

VARIETY :

593. Cerite—its Colour—Hardness—Specific Gravity —Fracture—Texture—Infusibility—Analysis by VAUQUELIN—Locality—Associations.

End of the Second Class, comprehending all those Substances in which a METAL *predominates.*

APPENDIX to CLASS II.

594. Account of the Discovery of four new Metals, in the Ore of Platinum, by Dr. WOLLASTON and Dr. TENNANT.

595. Of Palladium.

596. Of Rhodium.

597. Of Iridium.

598. Of Osmium.

CLASS

599. COMBUSTIBLE

600. Reason for excluding Metals — striking Difference between — Second and Third Class — Characters of Combustible —

ORDER

601. *Oleaginous.*

GENUS

602. **CARBON.**

603. Observations concerning the — elementary Principle—its — —Difference between Charcoal and — Remarks on the Oxidation of — —on the Timber found in — scripts in Herculaneum—Egyptian — Swathing of embalmed Birds in the — Repositories, near the Pyramids of —

C. 3. *O.* 1. *G.* 1.

SPECIES I.

604. CARBON *with Hydrogen and Oxygen.*

VARIETY:

605. Naptha—Mineral Oil—liquid Bitumen—Fluidity—Transparency—Odour—Lightness—Degree of Combustibility—Rarity—Substance mixed with it for Commerce — Situation in Nature — Localities — Uses.

606. Petroleum — liquid Bitumen — Modification of Naptha — Colour — Degree of Transparency — its Transition to Naptha, and *vice versa* — Localities of Petroleum properly so called — Manner in which it appears—its Uses.

607. Maltha — Mineral Pitch — Bitumen — in what distinguished from Petroleum—often confounded with it—Places in which it is particularly found —Uses of Maltha.

608. Asphaltum — Bitumen of Judæa — compact Mineral Pitch — Texture — Fracture — resinous Electricity — Specific Gravity — Combustion — where found—Manner of obtaining it on the Lake Asphaltites, or Dead Sea.

609. Elastic Bitumen—Properties of this Mineral—its Relationship to Mineral Oil—its remarkable Associations—Situation in Nature—where found—its Resemblance to Elastic Gum.

610. Jet — compact Petroleum — Black Amber — discordant Descriptions of the Mineral so called —chemical Character— Hardness—Texture — Fracture—Electricity—Manufacture of Jet.

611. Amber—Succin—Odour in burning—Refraction — resinous Electricity — Colour — Fracture — remarkable Association—Localities—how distinguished from Mellat of Alumine, or Honey-Stone — Notion of the Antients concerning Amber.

612. Of Insects in Amber—Gum Copal—how distinguished from Amber—Naptha obtained from Amber by Distillation—Hauy—Amber Varnish —Manufacture of Amber—its Uses among the Turks—*Eau de Luce.*

C. 3. *O.* 1. *G.* 1.

SPECIES II.

613. CARBON *with Hydrogen, Oxygen, Silex, or other Earths.*

VARIETY:

614. Cannel Coal—Origin of its Name—with Jet—where found—its pr—Combustion—Analysis by KIRWA facture of Cannel Coal.

615. Common Coal — Primitive Form accidental Associations — Blithe C Coal—Analysis by KIRWAN.

616. Kilkenny Coal — Localities — Pr mical Character.

617. General Observations on Coal, and

C. 3.

ORDER II.

618. *Not Oleaginous.*

GENUS I.

619. **CARBON.**

SPECIES I.

620. CARBON, *pure.*

VARIETY:

621. Diamond—its combustible Nature first asserted by BOËCE DE BOOT—subsequent Observation of Sir ISAAC NEWTON—Experiments of the Academicians of Florence—MACQUER—LAVOISIER.

622. Discovery made by TENNANT—confirmed by GUYTON MORVEAU—disputed by BIOT, and by BRONGNIART—ultimately established.

623. External Characters of Diamond — its Forms — Habitudes — Localities — Art of polishing Diamonds—Blemishes—Refraction—Electricity — various Colours — mechanical Division — remarkable Diamonds.

C. 3. *O.* 2. *G.* 1.

SPECIES II.

624. CARBON *with Iron.*

VARIETY:

625. Plumbago — Graphite — Carburet — its Resemblance to Sulphuret of Molybdenum — how distinguished from that Mineral — erroneous Notions of Plumbago — its Localities — Manner of its Deposition — Mine of Borrowdale — Uses of Plumbago.

C. 3. *O.* 2. *G.* 1.

SPECIES III.

626. CARBON *with Oxygen, Silex, and Iron.*

VARIETY:

627. Anthracite — Kohlenblende — Anthracolite — confounded with Coal — external Characters in which they differ — Friable Anthracite — Scaly — Foliated — Globular — Habitudes — Localities — Crystallized Anthracite — its Constituents according to VAUQUELIN.

C. 3. O. 2.

GENUS II.

628. **SULPHUR.**

SPECIES I.

629. SULPHUR *with Hydrogen.*

VARIETY:

630. Native Sulphur—Analysis by BERTHOLLET—double Refraction—Electricity—Massive Native Sulphur—dispersed—Pulverulent—two Methods of ascertaining its Composition—Habitudes—Localities—Extraction—Purification—Uses.

C. 3. O. 2. G. 2.

SPECIES II.

631. SULPHUR *with Iron.*

VARIETY:

632. Martial Pyrites — Thunderbolts — Sulphuret — Mode of their Deposition—Stalactite Forms—

Crystalline Forms — extraneous Fossils mineralized by this Compound—common Pyrites—Striated — Capillary — Magnetic — Spontaneous Decomposition—Habitudes of this Mineral.

End of the Third Class, comprehending all those Substances in which a COMBUSTIBLE, *not Metallic, predominates.*

APPENDIX to CLASS III.

633. Of Hydrogen, as a Mineral Combustible, and its Combinations.

634. Of Hydrogen Oxide, or WATER.

635. Of Hydrogen Carburet, Oxicarburet, and Hydrogen Sulphuret, or INFLAMMABLE GASES.

636. Of Hydrogen with Nitrogen, or AMMONIA.

CLASS IV.

637. ALKALIES.

ORDER I.

638. *With an Acid.*

GENUS I.

639. **POTASS.**

SPECIES I.

640. POTASS *with Nitric Acid.*

VARIETY:

641. Saltpetre—Nitre—striking Character by which it is manifested—Primitive Form—Constituents according to BERGMANN—Manner in which it appears—derives the Principle of its Existence from the Atmosphere—Preparation—Uses of Nitre.

C. 4. *O.* 1.

GENUS II.

642. **SODA.**

SPECIES I.

643. SODA *with Carbonic Acid.*

VARIETY:

644. Natron — Native Mineral Alkali — Carbonat — Analysis by BERGMANN—Re-union of Characters which distinguish it from every natural Alkaline Combination—Habitudes—Nature of its Origin —Localities—Origin of its Appellation.

C. 4. *O.* 1. *G.* 2.

SPECIES II.

645. SODA *with Sulphuric Acid.*

VARIETY:

646. Native Glauber's Salt—Sulphat—its Characters —how distinguished from Sulphat of Magnesia —Analysis by BERGMANN — Habitudes — Localities.

C. 4. *O.* 1. *G.* 2.

SPECIES III.

647. SODA *with Boracic Acid.*

VARIETY:

648. Native Borax—Manner in which it appears in Nature unknown — Analysis by KIRWAN — — double Refraction—Primitive Form — HERMANN's Account of its Formation in Persia—Localities of the Borax of Commerce—Borax of Bengal — Borax of China—Uncertainty in which its Natural History is involved.

C. 4. *O.* 1. *G.* 2.

SPECIES IV.

649. SODA *with Muriatic Acid.*

VARIETY:

650. Common Salt — its vast Importance — current Coin—Circassia—Egypt—its Fracture—Texture —Primitive Form—Colours—general Habitude

—particular Habitude—Localities—Salt Mines—Europe—Asia—Africa—America—Extraction of Salt—particular and remarkable Uses.

End of the Fourth Class, comprehending all those Substances in which an ALKALI *predominates.*

APPENDIX to the FOUR CLASSES.

651. On the most celebrated Mines, and their Productions—Mineralogical Travellers.

652. Mines of the Spanish Empire in North America—Sonora—California—New Spain—Zacatecas—antient Mexicans.

653. Mineral Regions of South America—Brazil—Popayan — Maranon — Potosi — Choco — Barbacoas—Chayanza—Paria—River of Emeralds—Cuença.

654. Mines of Europe—Austria—Bohemia—Kuttenberg — Joachimsthal — Keonstock—Zinwald—Dreÿhacken—Bleÿstadt—Minerals of Stiria—Carinthia—Carniola—Villach—Bleÿberg.

655. Mines of Idria—Hungary—Cremniz—Schemniz

—Transylvania—Bannat—Nagyag—Offenbanya —Boïtza—Wielitska.

656. Norwegian Mines — Kongsberg — Röråås — Arendahl—Fossum—Iceland—Ferrö Isles.

657. Swedish Mines — Ædelfors — Sala — Fahlun — Jemtland — Lapland — Bosna — Dannemora — Norberg—Scone.

658. Prussia—Saxony—Johngeorgenstadt—Freyberg.

659. Mines of France — Alsace — Deux Ponts — Britanny—Dauphigny—Aix la Chapelle—Paris —Aveyron.

660. Spain — La Mancha — Alcavas — Pyrenees — Portugal — Galicia — Catalonia — Asturias — Isle of Elba.

661. Mines of England — Cornwall — Anglesea — Cumberland — Derbyshire — Somersetshire — Wales — Shropshire — Gloucestershire — Lancashire—Cumberland—Cheshire.

662. Mines of Asia—Kingdoms of Ava and Pegu—River Irrawady—Ceylon—China—Hindostan—Visapour—Golconda—Thibet—Isles of Japan—Bingo—Kattami — Ginsima — Kinsima — Madagascar.

663. Siberia—Catharinebourg—Beresow—Nershintsk —Ural and Altaic Mountains—Odontchelon—Lake Baical.

664. Method of obtaining, selecting, and conveying Minerals—forming Cabinets of Mineralogy—packing, washing, and restoring Minerals.

665. Impositions practised by Dealers ---- False Minerals.

666. Concluding Observations.

N. B. The Reader will find *Chromat of Iron* placed *C.* 2. *O.* 1. *G.* 6. *Sp.* 7., and also *C.* 2. *O.* 2. *G.* 11. *Sp.* 1.—The recent Analysis of LOWITZ and of LAUGIER, as given in BRONGNIART*, tom. ii. p. 182, authorized the latter situation. In the Synopsis, *Tab. III.*, it is accordingly classed with the Genus CHROMIUM. Not being acidiferous, the term *Chromat* is improper. It has been therefore named *Chromite;* according to the method observed with Ores of TITANIUM, COLUMBIUM, TANTALIUM, and CERIUM, which severally bear the names of *Titanite, Columbite, Tantalite,* and *Cerite.*

* Traité Elementaire de Minéralogie; ouvrage composé par ordre du Gouvernment pour servir à l'enseignment dans les Lycées et Ecoles secondaires. *Paris,* 1807.

ERRATUM.—Page 46, No. 289. *for* Pyncite *read* Pycnite.

SYNOPSIS,

EXHIBITING

THE CLASSIFICATION OF MINERALS

ACCORDING TO

THE AUTHOR'S METHODICAL DISTRIBUTION.

ORDER.	GENUS.	SPECIES.	VARIETY.
1. *Acidiferous.*	1. *LIME.*	1. *With Carbonic Acid.*	Rock Milk. Chalk. Limestone. Marble. Fetid Stone. Stalactite. Spar.
		2. *With Sulphuric Acid.*	Earthy Gypsum. Compact Gypsum. Fibrous Gypsum. Foliated Gypsum.
		3. *With Fluoric Acid.*	Earthy, Compact, and Spar, Fluor.
		4. *With Phosphoric Acid.*	Earthy, and Compact Apatite.
		5. *With Arsenic Acid.*	Pharmacolite.
	2. ALUMINE.	1. *With Sulphuric Acid and Potass.*	Alum.
		2. *With Fluoric Acid.*	Cryolite.
		3. *With Mellitic Acid.*	Honey Stone.
	3. MAGNESIA.	1. *With Sulphuric Acid.*	Epsom Salt.
		2. *With Boracic Acid.*	Boracite.
	4. BARYTES.	1. *With Sulphuric Acid.*	Heavy Spar, Bologna Stone.
		2. *With Carbonic Acid.*	Witherite.
	5. STRONTIAN.	1. *With Carbonic Acid.*	Strontianite.
		2. *With Sulphuric Acid.*	Celestine.
2. *Not Acidiferous.*	1. SILEX.	1. *Almost Pure.*	Quartz. Opal. Flint.
		2. *With Alumine.*	Chalcedony. Plasma. Hornstone. Jasper. Agate.
		3. *With Alumine and Oxide of Iron.*	Mica. Talc. Hornblende. Obsidian.
		4. *With Alumine and Potass or Soda.*	Pumice. Pearl Stone. Pitch Stone. Leucite. Lepidolite. Feldspar.
		5. *With Alumine and Magnesia.*	Menilite.
		6. *With Oxide of Nickel, Alumine, and Water.*	Pimelite.
		7. *With Alumine, Glucine, and the Oxide of Chromium.*	Emerald. Euclase.
		8. *With Alumine and Barytes.*	Harmotome.
		9. *With Lime and Alumine.*	Lazulite.
		10. *With Alumine and Lime.*	Scapolite. Dipyre. Hyalite.
		11. *With Alumine, Water, Lime, and Potass.*	Zeolite. Stilbite. Analcime. Chabasie.
		12. *With Alumine, Lime, and Oxide of Iron.*	Prehnite. Axinite. Epidote. Scorza Garnet. Pyrope. Melanite
		13. *With Lime, Alumine, Oxide of Chromium, Magnesia, and Oxide of Iron.*	Smaragdite
		14. *With Magnesia.*	Keffekill. Steatite.
		15. *With Magnesia and Lime.*	Asbestus. Actinote. Malacolite.
		16. *With Oxide of Iron, Lime, and Magnesia.*	Pyroxelle.
		17. *With Magnesia, Oxide of Iron, and Lime.*	Idocrase. Meionite.
		18. *With Lime.*	Tremolite.
		19. *With Lime and Oxide of Copper.*	Dioptase.
	2. ALUMINE.	1. *With Water.*	Wavellite. Diaspore.
		2. *With Silex.*	Telesia. Corundum. Emery. Cymophane. Schorlite. Fibrolite. Nephiline.
		3. *With Silex and Magnesia.*	Spinelle. Ceylonite.
		4. *With Silex and Oxide of Iron.*	Tourmaline. Micarelle. Granatite.
		5. *With Magnesia and Silex.*	Cyanite.
		6. *With Oxide of Zinc, Iron, and Silex.*	Gahnite.
	3. MAGNESIA.	1. *With Silex and Alumine.*	Jade.
		2. *With Silex, Alumine, and Oxide of Iron.*	Comolite. Chlorite.
		3 *With Silex and Oxide of Iron.*	Chrysolite.
	4. ZIRCONIA.	1. *With Silex.*	Zircon.
	5. YTTRIA.	1. *With Silex and Oxide of Iron.*	Gadolinite.

CLASS 2. METAL minent.	ORDER.	GENUS.	SPECIES.	VARIETY.
	1. Ductile.	1. GOLD.	1. *With minute proportions of Silver, or Copper.*	Native Gold.
		2. PLATINUM.	1 *With Palladium, Rhodium, Iridium, and Osmium, new discovered Metals, whose Properties are not yet sufficiently known to have any other Place in this System.*	Platina.
		3. SILVER.	1 *With very minute Proportions of other Metals.*	Native Silver.
			2. *With Gold.*	Auriferous Native Silver.
			3. *With Antimony.*	White Silver Ore.
			4. *With Arsenic.*	Arsenical Silver.
			5. *With Sulphur.*	Vitreous and Black Silver.
			6. *With Sulphur, Antimony, and Iron.*	Antimoniated Sulphuret of Silver.
			7. *With Sulphur and Copper.*	Cupriferous Sulphuret of Silver.
			8. *With Antimony, Sulphur, and Oxygen.*	Red Silver.
			9. *With Muriatic Acid.*	Horn Silver.
			10. *With Carbonat of Antimony, and Carbonic Acid.*	Carbonat of Silver.
		4. MERCURY.	1. *Pure.*	Native Quicksilver.
			2. *With Silver.*	Native Amalgam.
			3. *With Sulphur.*	Native Cinnabar. Hepatic Mercurial Ore.
			5. *With Muriatic Acid.*	Horn Quicksilver.
		5. COPPER.	1. *Pure.*	Native Copper.
			2. *With Arsenic.*	White Copper Ore of Freyberg.
			3. *With Sulphur, and Iron.*	Vitreous, Pyritous, Purple, and Black Copper.
			4. *With Arsenic, Iron, Sulphur, and sometimes Silver.*	Grey Copper. (Fahlerz.)
			5. *With Antimony, Iron, Sulphur, and sometimes Silver.*	Grey Copper Ore. (Fahlerz.)
			6. *With Oxygen.*	Ruby, Compact Red, Foliated Red, and Fibrous Red Copper.
			7. *With Carbonic Acid, Oxygen, and Water.*	Copper Azure. Mountain Blue. Radiated Blue Carbonat of Copper. Malachite. Green Sattin Copper.
			8. *With Oxygen, Muriatic Acid, and Water.*	Green Sand of Peru.
			9. *With Oxygen, and Phosphoric Acid.*	Green Phosphat of Copper.
			10. *With Oxygen, Arsenic Acid, and Water.*	Blue Arseniated Copper. Green Arseniated Copper. Brown Arseniated Copper.
		6. IRON.	1. *With Nickel.*	Native, and Meteoric Iron.
			2. *With Arsenic.*	Mispickel — Arsenical Iron — *Grey Cobalt.*
			3. *With Oxygen.*	Magnetic Iron Stone — Loadstone. Magnetic Sand. Specular and Micaceous Iron Ore. Red Iron Stone. Compact Red Iron Ore. Red Hæmatites. Red Ochre. Brown and Compact Brown Iron Ore. Brown Hæmatites. Brown Ochre. Black and Argillaceous Iron Ore. Red Crayon. Columnar Iron Ore. Granular Argillaceous Iron Ore. Kidney-form Argillaceous Iron Ore. *Ætites, Baglestone.* Pisiform and Bog Iron Ore. Meadow Lowland Ore. Swampy and Morassy Iron Ore.
			4. *With Arsenic Acid, Oxygen, Copper, Water, and Silex.*	Green Cubic Iron, Arseniated Iron.
			5. *With Phosphoric Acid, Oxygen, and Manganese.*	Native Prussian Blue.
			6. *With Sulphuric Acid.*	Native Green Vitriol — *Green Copperas.*
			7. *With Oxygen and Carbonic Acid.*	Spathose, or Sparry Iron.
		7. TIN.	1. *With Oxygen.*	Tin Stone. Wood Tin.
			2. *With Sulphur and Copper.*	Tin Pyrites.
		8. LEAD.	1. *With Sulphur.*	Galena. Blue and Black Lead Ore.
			2. *With Oxygen.*	Earthy Lead Ore.
			3. *With Oxygen and Arsenic.*	Yellow Silky Lead of St. Prix.
			4. *With Oxygen and Carbonic Acid.*	White Lead Spar. Carbonated Lead.
			5. *With Muriatic Acid, and Carbonic Acid.*	Murio Carbonat of Lead, of Derbyshire, and the Hartz.
			6. *With Oxygen and Sulphuric Acid.*	Snow-White Sulphat of Lead of Anglesea.
			7. *With Oxygen, Phosphoric Acid, and a small proportion of Muriatic Acid.*	Green Lead.
			8 *With Oxygen, and Molybdic Acid.*	Yellow Lead.
			9. *With Oxygen, and Chromic Acid.*	Red Lead Ore of Siberia.
			10 *With Oxygen, and Oxide of Chromium.*	Chromat Lead.
		1. NICKEL.	1. *With Arsenic.*	Kupfer Nickel.
			2. *With Oxygen.*	Nickel Ochre.
			3. *With Arsenic Acid, Cobalt and Alumine.*	Arseniat of Nickel.
		2. ZINC.	1. *With Sulphur and Iron.*	Yellow, Brown, and Black Blende.
			2. *With Oxygen and Silex.*	Calamine.
			3. *With Oxygen, and Carbonic Acid.*	Carbonat of Zinc. *(Calamine.)*
			4. *With Oxygen, Carbonic Acid, and Water.*	Hydrous Carbonat of Zinc. *(Calamine.)*

S 2.	ORDER.	GENUS.	SPECIES.	VARIETY.
ued.	2. *Not Ductile.*	1. BISMUTH.	1. *With a small portion of Cobalt, or Arsenic.*	Native Bismuth.
			2. *With Sulphur.*	Common Bismuth.
			3. *With Oxygen.*	Bismuth Ochre.
		2. ANTIMONY.	1. *With a small portion of Silver.*	Native Antimony.
			2. *With Sulphur.*	Grey Antimony. Compact Antimony. Radiated Antimony. Plumose Antimony.
			3. *With Oxygen.*	White Antimony. Ochre of Antimony.
			4. *With Oxygen and Sulphur.*	Red Antimony.
		3. TELLURIUM.	1. *With Iron and Gold.*	Native Tellurium. *Aurum Problematicum.* White Gold. Sylvanite. Ferriferous Native Tellurium. Graphic Ore. *Aurum Graphicum.* Plumbiferous Native Tellurium. Grey Ore of Nagyag. Foliated Ore of Tellurium.
		4. ARSENIC.	1 *With Iron; often with Silver, and sometimes Gold.*	Native Arsenic. Testaceous Arsenic. Specular Native Arsenic.
			2. *With Sulphur.*	Realgar. Orpiment.
			3. *With Oxygen.*	Native Oxide of Arsenic.
			4. *With Cobalt, Iron, and Sulphur.*	*Arsenical Cobalt — Grey Cobalt.*
		5. COBALT.	1. *With Oxygen.*	Black Cobalt Ore. Brown Cobalt Ore. Yellow Cobalt Ore.
			2. *With Arsenic Acid.*	Red Cobalt Ore. Flowers of Cobalt. Peach-Blossom Ore.
			3. *With Sulphuric Acid.*	Native Vitriol of Cobalt. Red Transparent Stalactite Cobalt.
		6. MANGANESE.	1. *With Oxygen.*	Metalline Oxide of Manganese. Argentine Oxide. Compact Grey Ore of Manganese. Pulverulent Grey Ore of Manganese.
			2. *With Oxygen, and Sulphur.*	Black Ore of Manganese. Black Transylvanian Blende.
			3. *With Oxygen, Oxide of Iron, and Phosphoric Acid.*	Phosphat of Manganese. *Phosphat of Iron.*
			4. *With Oxygen, Carbonic Acid, and Iron.*	Red Ore of Manganese. White Ore of Kapnic. Siliciferous Manganese.
		7. TUNGSTEN.	1. *With Oxygen and Lime.*	Tungstat of Lime. Tungspar. White Tin Ore. White Wolfram. Calcareous Scheelin.
			2. *With Oxygen, Manganese and Iron.*	Wolfram.
		8. MOLYBDENUM.	1. *With Sulphur.*	Molybdena.
		9. URANIUM.	1. *With Oxygen.*	Pechblende, Uranite Ochre. Green Mica. Micaceous Uranite.
		10. TITANIUM.	1. *With Oxygen.*	Titanite. Red Schorl. *Cheveux de Venus.* Ruthile. Sagenite. Anatase. Oisanite. Octahedral Schorl.
			2. *With Iron and Silex.*	Menachanite. Gallitzinite.
			3. *With Lime and Silex.*	Nigrine. Sphene. Pictite. *Granular Tin of the Molucca Isles.*
		11. CHROMIUM.	1. *With Oxygen, Oxide of Iron, and Alumine.*	Chromite.
		12. COLUMBIUM.	1. *With Oxygen and Iron.*	Columbite.
		13. TANTALIUM.	1. *With Iron and Manganese.*	Tantalite.
			2. *With Iron, Manganese, and Yttria.*	Yttriferous Tantalite. Yttro Tantalite.
		14. CERIUM.	1 *With Oxygen, Silex, Water, and Carbonic Acid.*	Cerite.

CLASS 3.	ORDER.	GENUS.	SPECIES.	VARIETY.
A COMBUSTIBLE predominant.	1. *Oleaginous.*	1. CARBON.	1. *With Hydrogen and Oxygen.*	Naptha. Mineral Oil. Liquid Bitumen. Petroleum. Maltha. Mineral Pitch. Bitumen. Asphaltum. Bitumen of Judæa. Elastic Bitumen. Jet. Compact Petroleum. Black Amber. Amber. Succin.
			2. *With Hydrogen, Oxygen, Alumine, Silex, or other Earths.*	Cannel Coal. Common Coal. Blithe Coal. Duck Coal. Kilkenny Coal.
	2. *Not Oleaginous.*	1. CARBON.	1. *Pure.*	Diamond.
			2. *With Iron.*	Plumbago.
			3. *With Oxygen, Silex, and Iron.*	Anthracite. Kohlen Blende. Anthracolite.
		2. SULPHUR.	1. *With Hydrogen.*	Native Sulphur.
			2. *With Iron.*	Martial Pyrites.

CLASS 4.	ORDER.	GENUS.	SPECIES.	VARIETY.
An ALKALI predominant.	1. *Acidiferous.*	1. POTASS.	1. *With Nitric Acid.*	Salt-Petre. Nitre.
		2. SODA.	1. *With Carbonic Acid.*	Natron. Native Mineral Alkali.
			2. *With Sulphuric Acid.*	Native Glauber's Salt.
			3. *With Boracic Acid.*	Native Borax.
			4. *With Muriatic Acid.*	Common Salt.